

Endemism in the reptile fauna of Iran

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Iran contains 36 named endemic reptile species in 17 genera and seven families. The most endemic and speciose family is the Gekkonidae, followed by the Lacertidae. These two families collectively dominate with 22 species (or 60.1%) of the total endemic herpetofauna. Twenty one endemics are known only from a single location or restricted area within a single physiographic region. An analysis of endemism is given in terms of systematics and distribution.

Key words: Iran, herpetofauna, endemics, systematics, distribution, type locality

INTRODUCTION

Due to the wide geographical range and geological conditions coupled with the climatologically diverse environments, Iran is a rich country in terms of biodiversity, and it is considered as a center for the origin of numerous species. Iran mostly lies in the Palearctic zoogeographical realm bordering the Oriental and African ones (Coad and Vilenkin, 2004). The Northern and western Iran is considered as a part of the Irano-Anatolian biodiversity hot spot, which contains numerous centers of local endemism, so of considerable interest in this respect. The role of the Zagros Mountains, with an area about 533, 543 km², in separation, isolation and subsequent evolution of the Iranian lizard species is clear. This long mountain chain forms both a barrier between the central plateau and the Mesopotamian lowlands and a corridor for the southward distribution of northern faunal elements, as they have played a major role in the speciation of both *Asaccus* and *Tropiocolotes* and can rightly be called a world hot-spot for these genera.

Iranian habitats support 191 mammal species, 517 birds, more than 215 reptiles, 21 amphibians, 202 freshwater fishes and 8000 plants (Scott and Adhami, 2006; Heshmati, 2007; Karami et al., 2008; Rastegar-Pouyani et al., 2008; Esmacili et al., 2010), which are distributed in a wide variety of ecosystem types. Endemic species are an important part of the natural heritage of a country. Areas with significant numbers of endemics and/or systematically significant endemics are prime candidates for conservation. Their conservation has implications on a world-wide basis since, by definition, an endemic taxon is one found nowhere else (Coad, 2006). This paper records the endemic reptiles of Iran and discusses their endemism in terms of systematics and distribution.

MATERIAL AND METHODS

The source materials on which this paper is based are the accumulated knowledge listed in Latifi (1991, 2000), Leviton et al. (1992), Anderson (1999), Rastegar-Pouyani et al. (2006, 2007, 2008). Extensive materials were housed at the Collection of Biology Department of Shiraz University (ZM-CBSU), Razi University Zoological Museum (RUZM), and those examined at other museums (such as Gothenburg Natural History Museum (GNHM)). We, among others who have shared their

knowledge from 1865 to the present time carried out field studies at various times and localities in Iran. An endemic is here defined as any species found solely in Iran. Some species are known with rare specimens only from specific locations within the political boundaries of Iranian provinces (Iranian physiographic regions) or have a restricted distribution within Iranian Plateau. Others are recorded from Iranian provinces (Iranian physiographic regions) adjacent to neighboring countries and may eventually be found there but as yet are known only to be native to Iran. New geographical forms of endemic or native species are not included in the analysis.

RESULTS

The endemic reptile species are listed below in the systematics section. They comprise 36 named species in 17 genera and seven families; although this is expected to increase as new species are described. These endemic elements represent 16.28% of the herpetofauna in which 221 species are recognized in this study. The Gekkonidae, with 13 (36.1% of endemic species) endemics is ranked first followed by the Lacertidae with nine species (25%), the Scincidae with four species (11.1%), the families Colubridae, Phyllodactylidae, and Viperidae with three species (8.3% each). The family Typhlopidae, with only one endemic species, comprises 2.8% of the endemic herpetofauna. The families Gekkonidae and Lacertidae collectively dominate with 22 species (or 61.1% of the endemic fauna and 9.95% of the total herpetofauna). The earliest described endemic species is *Spalerosophis microlepis* in 1865. About a second (19 species or 52.77%) of the species have been described in the 25 past years. These are to be expected as new discoveries of species with restricted distributions and in groups which need taxonomic revision. The genus *Cyrtopodion* with seven (19.4% of endemic species) endemics is the most speciose genus, followed by *Eremias* with five (13.9%), *Ophiomorus* with four endemic species (11.1% each), *Asaccus* and *Mediodactylus* with three endemic species (8.3% each), respectively. Twelve genera have less than three endemic species. Among the members of *Eremias*, *E. nigrolateralis* Rastegar-Pouyani and Nilson (1997) previously considered an endemic species from Fars Province, was recently recognized as conspecific with the typical *E. persica* by E. Rastegar-Pouyani et al. (2010). Furthermore, recent described species of *Asaccus* by Toriki (2010) and Toriki et al. (2011 a, b), from Iran are considered by the authors as geographical forms of *A. elisae* (Werner, 1895), as well as *Carinatogekko stevenandersoni* Toriki, 2011 as synonym of *Mediodactylus aspratilis* (Anderson, 1973). Systematically significant endemics include a viper, a worm snake and a lacertid. The viper (*Pseudocerastes urarachnoides*) has the most elaborate morphological caudal ornamentation yet reported in a snake, with the possible exception of the rattles of *Crotalus* and *Sistrurus* (Bostanchi et al., 2006). It is a good subject for evolutionary studies. The worm snake (*Typhlops wilsoni*) is the only endemic member of its family in Iran with a single recorded specimen. The lacertid *Darevskia mostoufi* is a species with questionable validity. The locality of this species is some 500 km away from the nearest localities for other Lacertini (Arnold et al., 2007). The paratype of this species is a *Darevskia praticola praticola* (den Bosch, 1999). It is highly unlikely that either of these mesic species would have been present at the supposed type locality (Anderson, 1999). This highly doubtful taxon (*Darevskia mostoufi*) has not been considered in our endemics list. Resolution of many of these systematic problems will depend on the collection of large series of adults from different localities, in remote and hard to access areas, comparative materials from other countries, and the application of modern, molecular techniques.

Distribution: we considered the distribution of endemic reptiles based on Anderson (1999). He constructed 13 physiographic regions for discussing the geography of Iranian lizards as follows: The Central Plateau, the Urumiyeh basin, the Sistan basin, the Caspian Region, the Khuzestan Plain and the Persian Gulf Coast, Iranian Baluchistan and the Makran Coast, the Turkmen Steppe, the Moghan Steppe, the Zagros Mountains, the Western Foothills of the Zagros Mountains, the Alborz

Mountains, the Kopet Dagh, and Islands of the Persian Gulf. According to our results and previous records, the Iranian endemic reptiles are distributed in eight regions of these physiographical divisions (21 out of 31 politically divided provinces considered here (Fig. 1 and Table 1), of which five are also shared in their boundaries with neighboring countries (Tables 1 and 2). Among these regions, the Zagros Mountains contain the highest number of endemics, followed by the central Iranian Plateau and western foothills of the Zagros Mountains, respectively. Detailed distribution of the endemics in each physiographic region is given in Tables 1 and 2.

Unequivocal endemics, as presently understood, number 23 or 63.88% of the total endemics. Tables 1 and 2 show the recorded distribution of endemics within Iranian physiographic regions and provinces. In these tables, those physiographic regions and provinces which have shared boundaries with neighboring countries and the Iranian species that may eventually be found there are indicated with an octothorpe, although there are no confirmed records. Some species within an Iranian physiographic region sharing its boundary with a neighboring country have a known and limited distribution (valleys, caves) and probably are true Iranian endemics. There are three types of endemic distributions in Iran as follows:

a) Highly localized distribution

These are species known only from a single point locality. The one species of lacertids in the Kavir Desert (*Eremias andersoni*) probably is highly a localized taxon as mentioned above. Some new taxa are known only from a single locality but this may be an artifact of collecting, as there are no immediate geographical or ecological restrictions to them being more widespread within their distributional range. Some endemics are restricted to a single mountain, e.g. the *Asaccus kermanshabensis* is known only from a small cave in the Zagros Mountains.

b) Single physiographic region distribution

Twenty one endemics are known only from a single physiographic region, although they may occur in a wide range of localities within that physiographic region or other physiographic regions (excluding the single regional distribution, highly localized species above) (Table 3).

c) Multi- physiographic region distribution

Two species, the colubrids *Spalerosophis microlepis* (with the exception of unconfirmed records) and *Hierophis andreana* are recorded from several physiographic regions and probably are the most widespread Iranian endemics. The physiographic regions with the most recorded endemics are: the Zagros Mountains with 14 species, followed by the central Iranian Plateau and western foothills of the Zagros Mountains, with 13 and 9 species, respectively. The recorded endemics in each physiographic region of Iran are given in Table 2. The physiographic regions with the most recorded endemics restricted to that region are the Zagros Mountains and the Central Plateau with seven and four species, respectively. Other physiographic regions bearing 1-2 restricted endemics are given in Table 2.



FIGURE 1. Map of Iran showing the politically divided provinces.

TABLE 1- Recorded distribution of the endemics within Iranian physiographic regions and provinces.

Province	Physiographic region	Species	Author (s)
Bushehr	#The Khuzestan Plain and the Persian Gulf Coast	# <i>Cyrtopodion brevipes</i> , <i>Cyrtopodion gastropholis</i> , * <i>Cyrtopodion kiabii</i> # <i>Hierophis andreana</i>	Ahmadzadeh et al. (2011); Rajabizadeh and Rastegar-Pouyani (2008); Rastegar-Pouyani et al. (2006)
Chaharmahal and Bakhtiari	The Zagros Mountains	* <i>Montivipera kuhrangica</i> , # <i>Spalerosophis microlepis</i> , <i>Tropicolotes helena helena</i> # <i>Bunopus crassicauda</i> , * <i>Ophiomorus maranjabensis</i> ,	Latifi (2000); Rastegar-Pouyani et al. (2006); Rajabizadeh et al. (2011)
Esfahan	The Central Plateau	* <i>Eremias kavirensis</i> , * <i>Iranolacerta zagrosica</i> , # <i>Spalerosophis microlepis</i> , <i>Tropicolotes helena helena</i> , <i>Tropicolotes latifi</i> # <i>Cyrtopodion brevipes</i> ,	Rastegar-Pouyani and Nilson (1998); Latifi (2000); Rastegar-Pouyani et al. (2006); Mozaffari and Parham (2007); Kazemi et al. (2011)
Fars	The Zagros Mountains	<i>Cyrtopodion gastropholis</i> , * <i>Cyrtopodion persepolense</i> , * <i>Eirenis rechingeri</i> , # <i>Hierophis andreana</i> , <i>Mediodactylus aspratilis</i> ,	Werner (1917); Eiselt (1971); Anderson (1999); Latifi (2000); Rastegar-Pouyani et al. (2006); Rajabizadeh and Rastegar-Pouyani (2008); Nazarov et al. (2009)

#Golestan	#The Kopet Dagh	<i>Ophiomorus persicus</i> , # <i>Spalerosophis microlepis</i> , <i>Tropicolotes helena helena</i> , <i>Tropicolotes latifi</i> #* <i>Darevskia steineri</i>	Eiselt (1995)
Hamedan	The Zagros Mountains	<i>Eremias montanus</i> , <i>Mediodactylus aspratilis</i> , # <i>Spalerosophis microlepis</i>	Latifi (2000), Rastegar-Pouyani and Rastegar-Pouyani (2005), Karamiani and Rastegar-Pouyani (2011)
Hormozgan	#The Khuzestan Plain and the Persian Gulf Coast	# <i>Cyrtopodion brevipes</i>	Rastegar-Pouyani et al. (2006)
#Ilam	#The Western Foothills of the Zagros Mountains	# <i>Hierophis andreana</i> , * <i>Mediodactylus ilamensis</i> , # <i>Pseudocerastes urarachnoides</i> , # <i>Spalerosophis microlepis</i> , # <i>Tropicolotes helena helena</i> , # <i>Tropicolotes helena fasciatus</i> # <i>Cyrtopodion brevipes</i> , <i>Cyrtopodion kirmanensis</i> , * <i>Eremias lalezharica</i> , # <i>Hierophis andreana</i> , # <i>Mediodactylus sagittiferum</i> , <i>Ophiomorus persicus</i> , <i>Tropicolotes helena helena</i> , <i>Tropicolotes latifi</i> #* <i>Acanthodactylus nilsoni</i>	Rastegar-Pouyani et al. (2006); Fathinia et al. (2009 a, b); Fathinia and Rastegar-Pouyani (2010); Fathinia et al. (2010); Fathinia et al. (2011)
Kerman	The Central Plateau	* <i>Asaccus kermanshabensis</i> , # <i>Asaccus kurdistanensis</i> , <i>Eremias montanus</i> , # <i>Hierophis andreana</i> , <i>Mediodactylus aspratilis</i> , # <i>Pseudocerastes urarachnoides</i> , # <i>Tropicolotes helena fasciatus</i> , # <i>Tropicolotes helena helena</i> <i>Cyrtopodion gastropholis</i> , # <i>Pseudocerastes urarachnoides</i> , # <i>Spalerosophis microlepis</i> , # <i>Tropicolotes helena helena</i> , * <i>Typhlops wilsoni</i>	Moravec (1994); Anderson (1999); Kiabi et al. (1999); Rastegar-Pouyani et al. (2006); Rajabizadeh and Rastegar-Pouyani (2008)
#Kermanshah	#The Western Foothills of the Zagros Mountains	# <i>Asaccus kermanshabensis</i> , # <i>Asaccus kurdistanensis</i> , <i>Eremias montanus</i> , # <i>Hierophis andreana</i> , <i>Mediodactylus aspratilis</i> , # <i>Pseudocerastes urarachnoides</i> , # <i>Tropicolotes helena fasciatus</i> , # <i>Tropicolotes helena helena</i> <i>Cyrtopodion gastropholis</i> , # <i>Pseudocerastes urarachnoides</i> , # <i>Spalerosophis microlepis</i> , # <i>Tropicolotes helena helena</i> , * <i>Typhlops wilsoni</i>	Rastegar-Pouyani (1996); Rastegar-Pouyani (2006); Rastegar-Pouyani et al. (2006); Rajabizadeh and Rastegar-Pouyani (2008); Toraki et al. (2008); Fathinia et al. (2009a); Fathinia and Rastegar-Pouyani (2010); Karamiani and Rastegar-Pouyani (2011); Karamiani and Rastegar-Pouyani (2012)
#Khuzestan	#The Khuzestan Plain and the Persian Gulf Coast	# <i>Asaccus kermanshabensis</i> , # <i>Asaccus kurdistanensis</i> , <i>Eremias montanus</i> , # <i>Hierophis andreana</i> , <i>Mediodactylus aspratilis</i> , # <i>Pseudocerastes urarachnoides</i> , # <i>Tropicolotes helena fasciatus</i> , # <i>Tropicolotes helena helena</i> <i>Cyrtopodion gastropholis</i> , # <i>Pseudocerastes urarachnoides</i> , # <i>Spalerosophis microlepis</i> , # <i>Tropicolotes helena helena</i> , * <i>Typhlops wilsoni</i>	Wall (1908); Latifi (2000); Rastegar-Pouyani et al. (2006); Fathinia et al. (2009a); Fathinia and Rastegar-Pouyani (2010)
Kohgiluyeh and Boyer Ahmad	The Zagros Mountains	* <i>Apathya yassujica</i> , <i>Cyrtopodion gastropholis</i> <i>Mediodactylus aspratilis</i> , # <i>Spalerosophis microlepis</i> , <i>Tropicolotes helena helena</i>	Anderson (1973); Latifi (2000); Nilson et al. (2003); Rastegar-Pouyani et al. (2006)
#Kurdistan	#The Western Foothills of the Zagros Mountains	# <i>Asaccus kurdistanensis</i> , <i>Eremias montanus</i> * <i>Asaccus nasrullabi</i> , # <i>Hierophis andreana</i> , # <i>Spalerosophis microlepis</i> , <i>Tropicolotes helena fasciatus</i> , <i>Tropicolotes helena helena</i>	Rastegar-Pouyani (2006); Rastegar-Pouyani et al. (2006); Bahmani et al. (2011)
Lorestan	The Zagros Mountains	* <i>Apathya yassujica</i> , <i>Cyrtopodion gastropholis</i> <i>Mediodactylus aspratilis</i> , # <i>Spalerosophis microlepis</i> , <i>Tropicolotes helena fasciatus</i> , <i>Tropicolotes helena helena</i>	Latifi (2000); Rastegar-Pouyani (2006); Rastegar-Pouyani et al. (2006); Werner (2006); Rajabizadeh and Rastegar-Pouyani (2008)
Central (Markazi)	The Central Plateau	# <i>Bunopus crassicauda</i> , # <i>Spalerosophis microlepis</i>	Latifi (2000); Rastegar-Pouyani et al. (2006)
Qazvin	The Zagros Mountains	# <i>Bunopus crassicauda</i>	Anderson (1999); Rastegar-Pouyani et al. (2006)
Qom	The Central Plateau	# <i>Bunopus crassicauda</i> , # <i>Spalerosophis microlepis</i>	Anderson (1999); Latifi (2000); Rastegar-Pouyani et al. (2006)

Semnan	The Central Plateau	# <i>Bunopus crassicauda</i> , * <i>Eremias andersoni</i> , <i>Ophiomorus nuchalis</i> # <i>Cyrtopodion brevipes</i> ,	Darevsky and Szczerbak (1978); Nilson and Andren (1978); Anderson (1999); Rastegar-Pouyani et al. (2006)
#Sistan and Baluchistan	#The Sistan basin, Iranian Baluchistan and the Makran Coast	# * <i>Cyrtopodion golubevi</i> , <i>Cyrtopodion kirmanensis</i> , #* <i>Cyrtopodion sistanensis</i> , # <i>Mediodactylus sagittiferum</i> , #* <i>Ophiomorus streeti</i>	Blanford (1874); Anderson and Leviton (1966); Anderson (1999); Rastegar-Pouyani et al. (2006); Nazarov and Rajabizadeh (2007); Nazarov et al. (2009)
Tehran	The Alborz Mountains	# <i>Bunopus crassicauda</i> , * <i>Eremias papenfussi</i> , * <i>Montivipera latifii</i> , <i>Ophiomorus nuchalis</i>	Mertens et al. (1967); Nilson and Andr�en (1978); Anderson (1999); Rastegar-Pouyani et al. (2006); Mozaffari et al. (2011)
Yazd	The Central Plateau	<i>Tropicolotes latifi</i>	Rastegar-Pouyani et al. (2006)

* = endemic recorded alone in this province, # = province with joint boundary with neighboring countries and species potentially shared too. Species without an asterisk (*) superscript are endemics found in more than one province.

TABLE 2. – Recorded distribution of the endemics within the physiographic regions. * = endemic recorded alone in this physiographic region, # = physiographic region having joint boundary with neighboring countries.

Physiographic region	Species
The Central Plateau	<i>Bunopus crassicauda</i> , <i>Cyrtopodion brevipes</i> , <i>Cyrtopodion kirmanense</i> , * <i>Eremias andersoni</i> , * <i>Eremias kavirensis</i> , * <i>Eremias lalezharica</i> , <i>Hierophis andreana</i> , <i>Mediodactylus sagittiferum</i> , * <i>Ophiomorus maranjabensis</i> , <i>Ophiomorus nuchalis</i> , <i>Ophiomorus persicus</i> , <i>Spalerosophis microlepis</i> , <i>Tropicolotes latifi</i>
#The Sistan basin	* <i>Cyrtopodion sistanensis</i>
#The Khuzestan Plain and the Persian Gulf Coast	<i>Cyrtopodion brevipes</i> , <i>Cyrtopodion gastropholis</i> , * <i>Cyrtopodion kiabii</i> , <i>Hierophis andreana</i> , * <i>Typhlops wilsoni</i>
#Iranian Baluchistan and the Makran Coast	<i>Cyrtopodion brevipes</i> , * <i>Cyrtopodion golubevi</i> , <i>Cyrtopodion kirmanense</i> , <i>Mediodactylus sagittiferum</i> , * <i>Ophiomorus streeti</i>
The Zagros Mountains	* <i>Apathya yassujica</i> , * <i>Asaccus kermanshabensis</i> , * <i>Asaccus nasrullahi</i> , <i>Cyrtopodion gastropholis</i> , * <i>Cyrtopodion persepolense</i> , * <i>Eirenis rechingeri</i> , <i>Hierophis andreana</i> , * <i>Iranolacerta zagrosica</i> , <i>Mediodactylus aspratilis</i> , * <i>Montivipera keubrangica</i> , <i>Ophiomorus persicus</i> , <i>Spalerosophis microlepis</i> , <i>Tropicolotes belenae fasciatus</i> , <i>Tropicolotes belenae belenae</i> , <i>Tropicolotes latifi</i>
#The Western Foothills of the Zagros Mountains	* <i>Acanthodactylus nilsoni</i> , <i>Asaccus kurdistanensis</i> , <i>Eremias montanus</i> , <i>Hierophis andreana</i> , <i>Mediodactylus aspratilis</i> , * <i>Mediodactylus ilamensis</i> , <i>Pseudocerastes urarachnoides</i> , <i>Spalerosophis microlepis</i> , <i>Tropicolotes belenae fasciatus</i> , <i>Tropicolotes belenae belenae</i>
The Alborz Mountains	* <i>Eremias papenfussi</i> , * <i>Montivipera latifii</i>
#The Kopet Dagh	* <i>Darevskia steineri</i>

TABLE 3. – List of endemics recorded only from a single physiographic region.

Family Gekkonidae: <i>Cyrtopodion golubevi</i> , <i>C. kiabii</i> , <i>C. persepolense</i> , <i>C. sistanensis</i> , <i>Mediodactylus ilamensis</i>
Family Lacertidae: <i>Acanthodactylus nilsoni</i> , <i>Apathya yassujica</i> , <i>Darevskia steineri</i> , <i>Eremias andersoni</i> , <i>E. kavirensis</i> , <i>E. lalezharica</i> , <i>E. papenfussi</i> , <i>Iranolacerta zagrosica</i>
Family Phyllodactylidae: <i>Asaccus kermanshabensis</i> , <i>A. nasrullahi</i>
Family Scincidae: <i>Ophiomorus maranjabensis</i> , <i>O. streeti</i>
Family Typhlopidae: <i>Typhlops wilsoni</i>
Family Colubridae: <i>Eirenis rechingeri</i>
Family Viperidae: <i>Montivipera kubrangica</i> , <i>Montivipera latifii</i>

SYSTEMATICS**1- Suborder Sauria (Lacertilia)****Family Gekkonidae Gray, 1825****Genus *Bunopus* Blanford, 1874**

Bunopus crassicauda Nikolsky, 1907 - Thick-tailed tuberculated gecko

Type locality: Qom, Maljat-Abad, Chara-Magommed-Abad, Qom Province, Iran

Comment: There is a record for Djebel Amri, northeastern Syria; however, this requires verification (Anderson, 1999; see also Martens, 1997). The species might be more widely distributed than is currently known, but additional surveys are needed to investigate this.

Genus *Cyrtopodion* Fitzinger, 1843

Cyrtopodion brevipes (Blanford, 1874) - Blanford's short-toed gecko

Type locality: "Gedrosia (Baluchistan)"=Aptan, near Bampur, Sistan and Baluchistan Province, southeastern Iran.

Comment: Kluge (2001: 7) lists seven species in *Cyrtopodion*, all occurring in Pakistan or contiguous areas, such as *C. brevipes*.

Cyrtopodion gastropholis (Werner, 1917) - Werner's bent-toed gecko

Type locality: Fars Province, southern Iran.

Comment: This species is closely allied to *C. agamuroides* (see Anderson, 1999: 156-158).

Cyrtopodion golubevi Nazarov, Ananjeva and Rajabizadeh, 2009 - Golubev's angular-toed gecko

Type locality: 100 km northwest from Iranshahr, near Bazman (27°52' N, 60°06' E, 1060 m elevation), Sistan and Baluchistan Province, southeastern Iran.

Comment: Apparently, this species is distributed in southern Iran, and is likely to be found in bordering regions of Pakistan as well (Nazarov et al., 2009).

Cyrtopodion kiabii Ahmadzadeh, Flecks, Torki and Böhme, 2011 - Kiabii's angular-toed gecko

Type locality: 4.5 km southwest of Nayband village at a distance of approximately 300 m to coast of Persian Gulf, 27°21'9.5" N, 52°37'56.5" E, 108 m above sea level, Bushehr Province, southern Iran.

Cyrtopodion kermanensis (Nikolsky, 1900) - Kerman bent-toed gecko

Type locality: Taftan Mountain (Kuh-i-Taftan), in Sargado, and eastern Kerman, Kerman Province, Iran.

Cyrtopodion persepolense Nazarov, Ananjeva and Rajabizadeh, 2009 - Persepolis angular-toed gecko

Type locality: 60 km northeast from Shiraz, Takht-e-Jamshid (Persepolis), 29°55'N, 52°53'E, 590 m elevation, Fars Province, southern Iran.

Comment: Known with certainty only from the type locality. It is very likely that there will be new findings of this species within Fars Province (Nazarov et al., 2009).

Cyrtopodion sistanensis Nazarov and Rajabizadeh, 2007 - Sistan angular-toed gecko

Type locality: Nosratabad (29°50' N, 59°53' E, 1300 m elevation), 90 km west of Zahedan, Sistan and Baluchistan Province, southeastern Iran.

Comment: It is probable that the species occurs throughout the whole of southeastern Iran and in parts of adjacent Pakistan, although this needs to be confirmed (Nazarov and Rajabizadeh, 2007).

Genus *Mediodactylus* Szczerbak and Golubev, 1977

Comment: Members of this genus formerly placed in the genus *Carinatogekko* Golubev and Szczerbak, 1981 (see Červenka et al., 2010).

Mediodactylus aspratilis (Anderson, 1973) - Iranian keel-scaled gecko

Type locality: 35 km east of Gach Saran [30°20' N, 50°48' E], Kohgiluyeh and Boyer Ahmad Province, southwest of Iran.

Comment: Formerly considered as *Carinatogekko aspratilis* (Anderson, 1973). *Bunopus aspratilis* Anderson, 1973, was the original designation.

Mediodactylus ilamensis (Fathinia, Karamiani, Darvishnia, Heidari, and Rastegar-Pouyani, 2011) – Ilamian keel-scaled gecko

Type locality: Western foothills of the Zagros Mountains (32°57'51" N, 47°03'23" E, alt. 543 m), Zarin-Abad region, Dehloran Township, Ilam Province, southwestern Iran.

Comment: *Carinatogekko ilamensis* is as yet known only from the type locality (Fathinia et al., 2011). It is very likely that there will be new findings of this species within Ilam Province.

Mediodactylus sagittiferum (Nikolsky, 1900) - Jazmurian bent-toed gecko

Type locality: Bampur, Jaz Murian Depression, Sistan and Baluchistan Province, southeastern Iran.

Comments: Probably to be found in bordering regions of Pakistan as well. *Cyrtopodion sagittiferum* (Nikolsky, 1900) is a junior synonym.

Genus *Tropicolotes* Peters, 1880

Comments: Sindaco and Jeremčenko (2008) follow Kluge (1991, 1993) in assigning *helenae*, *latifi* and *persicus* to the genus *Microgekko* Nikolsky, 1907. The taxonomy of this genus remains unsettled (Rastegar-Pouyani et al., 2008).

Tropicolotes helenae (Nikolsky, 1907) - Banded dwarf gecko

Comments: *Tropicolotes helenae helenae* (Nikolsky, 1907) - Khuzestan dwarf gecko (Type locality: Bid Zard, Khuzestan Province) and *T. h. fasciatus* Schmidtler and Schmidtler, 1972 - Schmidtler's dwarf gecko (Type locality: Sorkh-e Dize, 125 km west of Kermanshah, on road to Qasr-e-Shirin, Kermanshah Province [close to Iraqi border at 1000-1500 m. elevation]) are Iranian endemic subspecies. It may be present in northern Iraq (Szczerbak and Golubev 1996). The Westernmost record of *T. h. helenae* in Iran belongs to Qasr-e-Shirin (34°31' N, 45°35' E) and Sarpol-e-Zahab (34°24' N, 45°52' E) in Kermanshah Province [close to Iraqi border], western Iran (Karamiani and Rastegar-Pouyani, 2012).

Tropicolotes latifi Leviton and Anderson, 1972 - Latifi's dwarf gecko

Type locality: Kerman, Kerman Province, Iran.

Comment: It may be broadly distributed over the Central Plateau (Anderson, 1999).

Family Lacertidae Bonaparte, 1831**Genus *Acanthodactylus* Fitzinger, 1834**

Acanthodactylus nilsoni Rastegar-Pouyani, 1998 - Nilson's spiny-toed lizard

Type locality: 5 km south of Qasr-e-Shirin (34°30' N, 45°33' E), about 7 km to the Iranian-Iraqi border, at 285 m elevation, Kermanshah Province, western Iran.

Comment: It may range further toward south and possibly into Iraq.

Genus *Apathya* Méhely, 1907

Apathya yassujica (Nilson, Rastegar-Pouyani, Rastegar-Pouyani and Andrén, 2003) - Yassujian lizard

Type locality: 30 km southwest of Yassuj, Kohgiluyeh and Boyer Ahmad Province, western Zagros Mountains, Iran.

Comment: Formerly considered as *Lacerta yassujica* (see Arnold et al., 2007).

Genus *Darevskia* Arribas, 1997

Comment: The validity of endemic species, *Darevskia mostoufi* (Baloutch, 1976), formerly considered as *Lacerta mostoufi* Baloutch, 1976 is questionable (see In den Bosch, 1999).

Darevskia steineri (Eiselt, 1995) - Steiner's lacerta

Type locality: Gole-Loweh near Minou-Dasht (33°11' N, 35°21' E), southeast of Gönbad-e-Kavous, northeastern Iran.

Comments: Formerly considered as *Lacerta steineri* Eiselt, 1995. This species is known only from the type locality. It might be more widely distributed in suitable habitats, although further surveys are needed to confirm this.

Genus *Eremias* Fitzinger, 1834

Eremias andersoni Darevsky and Szczerbak, 1978 - Anderson's racerunner

Type locality: 40-45 km east of Namak Lake (Daryacheh-ye Namak) (34°30' N, 52°40' E), Dasht-e-Kavir desert, Semnan Province, Iran.

Comment: It is known only from the type locality.

Eremias kavirensis Mozaffari and Parham, 2007 - Maranjaab racerunner

Type locality: Maranjaab sand dunes, 34°17'51" N, 51°50'57" E, Kavir Desert (Dasht-e-Kavir), Esfahan Province, Iran.

Comment: It is currently known only from the type locality and believed to be a restricted-range species (Mozaffari and Parham, 2007).

Eremias lalezharica Moravec, 1994 - Lalezhar racerunner

Type locality: Lalezhar (29°31' N, 56°51' E), north foot of Mount Lalezhar (elevation 2800-3100 m), Kerman Province, south-central Iran.

Comment: It is unclear if this species has a restricted range and additional research is needed to better understand the distribution.

Eremias montanus Rastegar-Pouyani and Rastegar-Pouyani, 2001 - Mountain racerunner

Type locality: Upland regions of the Zagros Mountains, 60 km northeast of city of Kermanshah (34°52' N, 47°5' E), Kermanshah Province, western Iran, at about 1800 m elevation.

Eremias papenfussi Mozaffari, Ahmadzadeh and Parham, 2011 - Papenfuss's racerunner. Type locality: Sooleghan Mountains (35°47'44.9" N, 51°14'20.2" E, alt. 1794 m), Tehran Province in the Alborz Mountain Range, Iran.

Genus *Iranolacerta* Arnold, Arribas and Carranza, 2007

Iranolacerta zagrosica (Rastegar-Pouyani and Nilson, 1998) - Zagrosian lacerta

Type locality: Zagros Mountains, at about 2450 m elevation, 3 km northwest of Fereydun Shahr (32°58'N, 50°04'E), about 140 km northwest of Esfahan city, Esfahan Province, west-central Iran.

Comment: Originally described as *Lacerta zagrosica* Rastegar-Pouyani and Nilson, 1998 (see Arnold et al., 2007). It is presumably more widespread than is currently known.

Family Phyllodactylidae Gamble, Bauer, Greenbaum, and Jackman, 2008

Genus *Asaccus* Dixon and Anderson, 1973

Comment: The genus *Asaccus* formerly belonged to the family of Gekkonidae, but recently has been placed in the Phyllodactylidae family based on molecular evidence (Gamble et al., 2008).

Asaccus kermanshabensis Rastegar-Pouyani, 1996 - Kermanshah leaf-toed gecko

Type locality: "Mianrahan region, Zagros Mountains, 40 km northeast of the city of Kermanshah, Kermanshah Province" in western Iran.

Comment: Despite the extensive survey of the area, this species is known only from the type locality.

Asaccus kurdistanensis Rastegar-Pouyani, Nilson and Faizi, 2006 - Kurdistan leaf-toed gecko

Type locality: 10 km northwest of Sarvabad (35°08' N, 46°17' E), between Marivan and Sanandaj, Kurdistan Province, at about 1850 m elevation, western Iran.

Comment: This species is likely to be more widely distributed than is currently known. It may range further toward south, and possibly into north-eastern Iraq (Torki et al., 2008).

Asaccus nasrullahi Werner, 2006 - Nasrullah's leaf-toed gecko

Type locality: Shahbazan, Lorestan Province, southwestern Iran.

Comment: Formerly misidentified as *Ptyodactylus hasselquistii* by Schmidt (1955: 203). Later, it was re-examined by Y. Werner, who recognized it as a new species of *Asaccus* and named as *A. nasrullahi*.

Family Scincidae Opperl, 1811

Genus *Ophiomorus* Duméril and Bibron, 1839

Ophiomorus maranjabensis Kazemi, Farhadi Qomi, Kami and Anderson, 2011 - Maranjab's snake skink

Type locality: Maranjab (34°19'52.78" N, 51°53'20.44" E), north of Esfahan, south of Daryache Namak (Salt Lake), Esfahan Province, Iran.

Comment: Known only from the type locality (Kazemi et al., 2011).

Ophiomorus nuchalis Nilson and André, 1978 - Plateau snake skink

Type locality: Siah Kuh (Black Mountains) in the central part of the Kavir Protected Region, about 150 km south of Tehran, Iran, 34°44' N, 52°11' E.

Ophiomorus persicus (Steindachner, 1867) - Persian snake skink

Type locality: Iran, restricted according to Anderson and Leviton, 1966, to Fars Province, 5 km southeast of Pol-e-Abgineh, approximately 29°33' N, 51°46' E.

Comment: It is likely to be reasonably widespread within the Zagros Mountains.

Ophiomorus streeti Anderson and Leviton, 1966 - Street's snake skink

Type locality: 18 km west of Iranshahr, Sistan and Baluchistan Province, southeastern Iran.

Comment: It is likely to be reasonably widespread within the Jaz Murian Depression of Sistan and Baluchistan.

2- Suborder Ophidia (Serpentes)

Family Typhlopidae Merrem, 1820

Genus *Typhlops* Schneider, 1811

Typhlops wilsoni Wall, 1908 - Iranian worm snake

Type locality: "Maidan Mihaftan, 30 miles east of Shustar in southwestern Iran".

Comment: It is known only from the type locality.

Family Colubridae Opperl, 1811**Genus *Eirenis* Jan, 1863**

Eirenis rechingeri Eiselt, 1971 - Rechinger's dwarf racer

Type locality: 57 km west of Shiraz (= 8 km east of Dasht-e-Arjan (Arjan Wetland)), at 2100 m elevation.

Comment: The presence of the second specimen of this rare species has recently been documented by Gholamhosseini et al. (2009) after identifying a specimen of *E. rechingeri* labeled "Fars Province in 2000" from an unknown locality.

Genus *Hierophis* Fitzinger in Bonaparte, 1834

Hierophis andreana (Werner, 1917) - Andrea's racer

Type locality: Fars Province, southern Iran.

Comment: *Zamenis andreana* Werner, 1917 and *Coluber* (s.l.) *andreas* Schätti and Monsch (2004) are synonyms; *Z. andreas* was recently recorded again for Iran by Rastegar-Pouyani et al. (2008).

Genus *Spalerosophis* Jan in De Filippi, 1865

Comment: *Spalerosophis microlepis* Jan, 1865 is the type species of the genus *Spalerosophis*.

Spalerosophis microlepis Jan, 1865 - Jan's diadem snake

Type locality: Larestan and Shiraz, Fars Province (restricted to Larestan (Schmidt, 1939).

Comment: It may occur in west of Kerman, north of Hormozgan, and the extreme western Yazd Province. Record of this species from Semnan by Firouz (2005), which is clearly beyond the fringes of the Zagros Range, requires confirmation (Schätti et al., 2009). The species might be present in Iraq, although this requires confirmation.

Family Viperidae Laurenti, 1768**Genus *Montivipera* Nilson, Tuniyev, André, Orlov, Joger and Herrmann, 1999**

Montivipera kuhrangica Rajabizadeh, Nilson and Kami, 2011 - Kuhrang mountain viper

Type locality: Tulip valley (Darreye Lale or Dashte Lale) (32°36' N, 50°11' E, alt. 2490 m), 8 km north east of Chelgerd village, Kuhrang region, Chaharmahal and Bakhtiari Province, Central Zagros Mountains, Iran.

Comment: Described based on a single specimen as well as a photo of a second lost specimen.

Montivipera latifii (Mertens, Darevsky and Klemmer, 1967) - Latifi's viper

Type locality: Lar region, Damavand, Tehran Province, Iran.

Comment: *Vipera latifii* is the original designation.

Genus *Pseudocerastes* Boulenger, 1896

Pseudocerastes urarachnoides Bostanchi, Anderson, Kami and Papenfuss, 2006 - Iranian spider viper

Type locality: 70 km southwest of Ilam (probably on road to Amirabad and Mehran), Ilam Province, western Iran.

Comment: As the recorded distribution of this species is in the western borders of Kermanshah, Ilam, and Khuzestan provinces just in the vicinity of the Iraqi border, it should also be expected in the contiguous areas of Iraq to the northwest, having similar habitat (Fathinia and Rastegar-Pouyani, 2010).

DISCUSSION

The Iranian endemic herpetofauna forms a significant part of the total species known in this country. New species are usually described from one or a few localities and are consequently often endemic. The proportion of endemics is expected to rise as further studies on these herpetofauna

are carried out. Based on the substantial evidence that recent global patterns of extinction are dominated by regions rich in endemic species (Raxworthy and Nussbaum, 1996), in other regions of the world, areas with high local endemism are now being ranked as sites of high conservation priority. Unless our understanding of patterns of reptile endemism is complete, we will be unable to exactly determine which species are most vulnerable to extinction in Iran.

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