A Preliminary Study of the Lizard Fauna and Their Habitats in Northwestern Iran

F. Ahmadzadeh[1,*], B. H. Kiabi[2], H. G. Kami[3] and V. Hojjati[4]

[1]*Department of Biodiversity and Ecosystem Management, Environmental Sciences Research Institute, Shahid Beheshti University, Evin, Tehran, Iran,*
[2]*Department of Biology, Faculty of Sciences, Shahid Beheshti University, Tehran, Iran,*
[3]*Department of Biology, Faculty of Sciences, Agricultural Sciences and Natural Resources University, Gorgan, Iran,*
[4]*Damghan Islamic Azad University, Damghan, Iran.*
**Corresponding author E-mail: f_ahmadzade@sbu.ac.ir*

Abstract.- Northwestern Iran has unique geographical and climatic conditions that support a rich flora and fauna. In view of the lack of in-depth studies on the lizards of the region, an investigation was started in the northern part of Ardabil Province for an inventory of this component of the fauna and their habitats. Collections were made from October 2003 to June 2005 and 165 specimens were collected and identified. Five families, 12 genera and 15 species are represented, including Agamidae: *Laudakia caucasia, Phrynocephalus persicus, Trapelus ruderatus*; Lacertidae: *Lacerta media media, Lacerta strigata, Lacerta brandtii, Darevskia raddei raddei, Eremias strauchi strauchi, Eremias arguta, Ophisops elegans*; Scincidae: *Mabuya aurata transcaucasica, Eumeces schneiderii princeps, Abelepharus bivittatus*; Anguidae: *Pseudopus apodus* and Gekkonidae: *Cyrtopodion caspium caspium*. Comparing this list to the data provided by Anderson (1999), it seems that most of the lizards are being reported for the Province for the first time. The families Gekkonidae and Anguidae are newly recorded, and the gecko *Cyrtopodion caspium* is first recorded from the west and northwest of Iran. With seven species represented in the area, lacertids have the highest species diversity among the lizard families and need further study. Habitat features also have been given for all species.

Keywords.- Iran, Ardabil, fauna, lizard, *Lacerta.*

Introduction

General information about the herpetofauna of Iran has been provided by Mertens (1957), Anderson (1966), Tuck (1971, 1974), Latifi (1984, 1991), Balouch and Kami (1995) and Kami and Vakilipoure (1996a, 1996b). Furthermore, a handbook of amphibians and reptiles of the Middle East has been published by Leviton et al. (1992), a book on the Lizards of Iran was recently published by Anderson (1999) and an updated checklist to the lizards of Iran was provided by Firouz (2000). Despite these publications, the lizards of Iran are still poorly-known and infrequently collected, with many new species still being discovered (Rastegar-Pouyani, 1996; Rastegar-Pouyani and Nilson, 1998). Studies on the lizards of Ardabil Province are also very limited (Ahmadzadeh, 2004).

The aim of this study is to determine in detail the lizard fauna and their habitat features in the northern part of Ardabil Province, which is of particular significance considering the unique geography and vegetation of the region. Moreover, this study will collect baseline population data for future management.

Materials and Methods

The area of study is in the Northwest part of Iran, specifically, the northern part of Ardabil Province (38° 15' E, to 39° 40' E, 47° 30' N to 48° 00' N). The region is surrounded by the Alborz Mountains and the Caspian Sea to the east, Aras village is to the north, Arasbaran protected area and Gare-Dagh Mountain to the west and the Sabalan Mountain chains to the south (Fig. 1). Altitude ranges between 20 m in the Moghan steppe to 4,888 m on the Sabalan Mountain. The study was carried out between October 2003 and June 2005. All of the samples were caught by hand and some lizards which are active and difficult to catch, such as green lizards (e.g., *Lacerta m. media* and *L. strigata*), were captured by dust shot. Locality data and their habitat features were recorded for all species encountered during the study. However, all have been preserved in accordance to standard methods (Formalin 10%) and voucher specimens are stored in the Biodiversity and Ecosystem Management Department Collection (BEMD) at Shahid Beheshti University of Iran. Specimens were identified with Leviton et al. (1992) and Anderson (1999) using morphometric measurements, coloration and pholidosis features (including

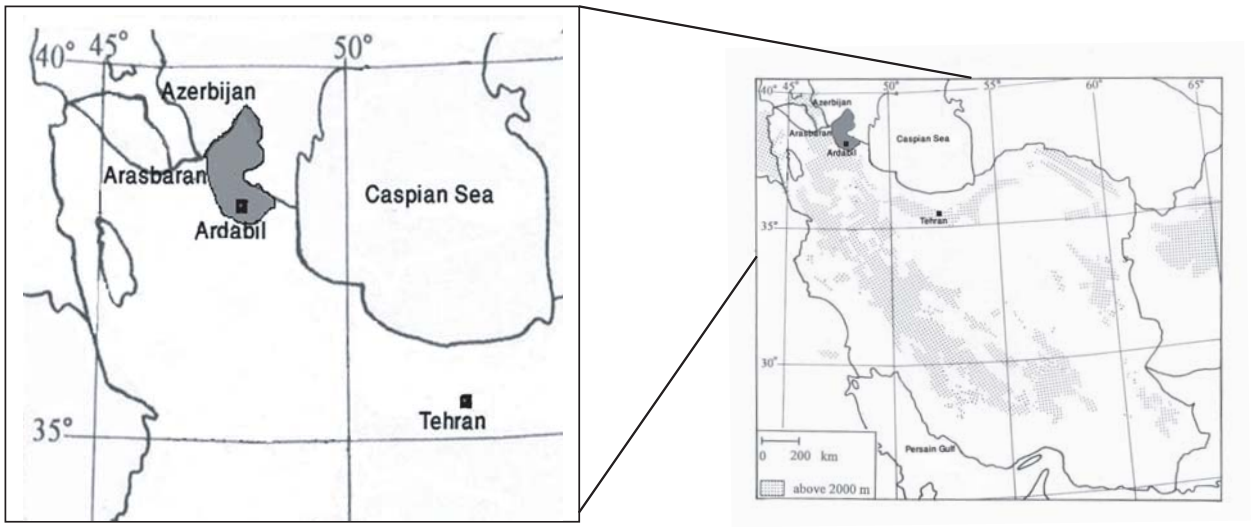

Figure 1. The study area, the northern part of Ardabil Province of Iran.

the number, structure and range of plates).

Results

A total of 165 samples were collected in the study area, comprising 15 species in 12 genera and 5 families. The species composition is given in Table 1. Distribution of species are presented in Figure 2.

Family: Agamidae

Laudakia caucasia caucasia (Eichwald, 1831)

Laudakia c. caucasia is widely distributed in the study area, preferring montainous habitats and eroded sand canyons in flooded plains adjacent to mountains, rock cliffs, old houses and stony walls near roads. At 6 km^2, 210 specimens were recorded on 10 June 2004 in Meshkinshar. This species was also collected on 24 November and 3 March in the Meshkinshahr and Arshagh areas at elevations between 500–2,800 m. Specimens were light olive to dark gray in ground color with adult snout-vent length of 152 mm in males and 155 mm in females.

Phrynocephalus persicus persicus De Filippi, 1863

This species was rarely encountered in the study area. Four specimens were captured in Arshagh, Alma village – a semi-arid area with ephemeral plants in spring and loamy soil. Xerophyte vegetation, both plants and bushes, grow in these areas. Dorsal coloration was light brown with three dark transverse marks, within which on the hind limbs were enlarged tubercular scales. The largest female was 40 and 48 mm snout-vent and tail length, respectively. During the study period, no males were found.

Trapelus ruderatus ruderatus (Olivier, 1804)

The small agamid lizard *Trapelus r. ruderatus* was found on open stony ground and in cultivated fields with sparse weed vegetation in autumn. On sunny summer days, it hides under weeds such as *Euphorbia* spp., *Chenopodium* spp. and *Chrozophora tinctoria*. Its activity appears to begin in early June and extends to late September. In total, 10 specimens were collected on the harvested wheat and barley fields in Gooshe area at approximately at 10:30 AM. Ground color was typically grayish-brown with five dark transverse bars on the trunk which were interrupted by a series of light ovoid vertebral spots (Fig. 3). The largest male examined with distinct callous preanal scales, had a 65 mm snout-vent and 74 mm tail length. The largest female had measurements of 63 mm and 75 mm, respectively.

Family: Anguidae

Pseudopus apodus (Pallas, 1775)

Pseudopus apodus occurs throughout the Hyrcanian forest of northern Iran. It has recently been collected from the Arasbaran protected area, but there are no records for Ardabil Province. This species was found in grassland and shrubby vegetation near streams. On a sunny day, four *P. apodus* were observed in a pond. The ground color of the dorsum was gray with zig-zagging blackish-brown stripes in the juvenile. The head was light yellowish-brown in adults with the remainder of the body dark brown. The longest adult had a 520 mm snout-vent length and a 670 mm tail.

Family: Gekkonidae

Cyrtopodion caspium caspium (Eichwald, 1831)

An isolated population of *Cyrtopodion caspium* was found in the Moghan Steppe for the first time, representing a new family record for northwestern Iran. One spec-

Table 1. Lizard species collected from the study area.

Family	Species	Common Name
Agamidae	*Laudakia caucasia*	Caucasian agama
	Phrynocephalus persicus	Persian toad agama
	Trapelus ruderatus	Olivier's agama
Anguidae	*Pseudopus apodus*	Glass-snake, sheltopusik
Gekkonidae	*Cyrtopodion caspium*	Caspian bent-toed gecko
Lacertidae	*Darevskia r. raddei*	Azarbaijan lizard
	Eremias arguta	Steppe-runner
	Eremias strauchi	Strauch's racerunner
	Lacerta brandtii	Persian lacerta
	Lacerta media	Three-lined lizard
	Lacerta strigata	Caspian green lizard
	Ophisops elegans	Snake-eyed lizard
Scincidae	*Ablepharus bivittatus*	Two-streaked snake-eyed skink
	Eumeces schneiderii	Schneider's skink
	Mabuya aurata	Transcaucasian grass skink

imen was collected at night on walls of an old house at 20 m elevation. After sunset they fed on various nocturnal insects around lights. Dorsal scales are strongly keeled. Dorsal body coloration was light gray with five dark transverse bars on the body and 11–12 on the tail (Fig. 4). In Pars-Abad, one male specimen with a snout-vent length of 75 mm and a tail length of 70 mm was measured.

Family: Lacertidae

Darevskia raddei raddei (Boettger, 1892)

Darevskia r. raddei is common in rocky areas where *Laudakia caucasia* is also frequently found. In March, this species was seen on vertical surfaces of rocks in the Kapas Mountains near Meshkin-Shahr. *Darevskia r. raddei* is various shades of light brown dorsally and more common in the rocky habitats than other lacertids. Specimens were found below altitudes of 900 m in Meshkinshar, but in the Salavat and Arshag Mountains, it was collected at altitude up to 2,400 m. The relationship of this subspecies to *D. r. vanensis* in northwestern Iran requires further study. The largest male had a snout-vent of 71 mm and tail length of 131 mm. One adult female had a 70 mm snout-vent length and 130 mm tail length (Fig. 5).

Lacerta brandtii De Filippi, 1863

Lacerta brandtii was collected under stones, on foothills and in the burrows of other animals in open arid bushy and stony habitats in the Razeye area. Large numbers of this lizard were also found in Samian District, 100 km from the study area on a foothill surrounded by cultivated land. The relationship between the two Iranian populations of this species in Esfahan Province and east Azarbijan Province remains problematic. This species is less active in comparison to other lacertid lizards such as *Darevskia raddei*. The dorsal surface was olive-gray with small black spots (Fig. 6) and the ventral surface had 8 longitudinal rows of plate. The longest male specimen had total length of 192 mm. The tail of this species displays autotomy (approximately 60% of total specimens).

Eremias arguta (Pallas, 1773)

Eremias arguta has a limited distribution in the study area: one adult specimen was collected in a harvested barley field on a sunny day near to the Ardabil-Meshkin road and two juvenile specimens were captured in the Ardabil Airport area in August 2004. This lizard had a white belly and a dorsum with white spots edged with black on a grayish background (Fig. 7) that sometimes formed transverse bands in the adults. Our adult specimens had a 95 mm snout-vent length and a 110 mm tail.

Eremias strauchi strauchi Kessler, 1878

There are two subspecies of this lizard in Iran – *Eremias s. strauchi* and *E. s. kopetdaghica*, of which only the first was found in the study area. The specimen was collected in the eastern part of the study area in the Arshag plain under wheat straw in a dry, stony harvested field. *Eremias s. strauchi* is active and hides in shrubby vegetation. Five eggs of this lizard were found under an *Artemisia* sp. shrub on 14 June 2004 in Amir-Abad village. In the study area one male specimen was measured

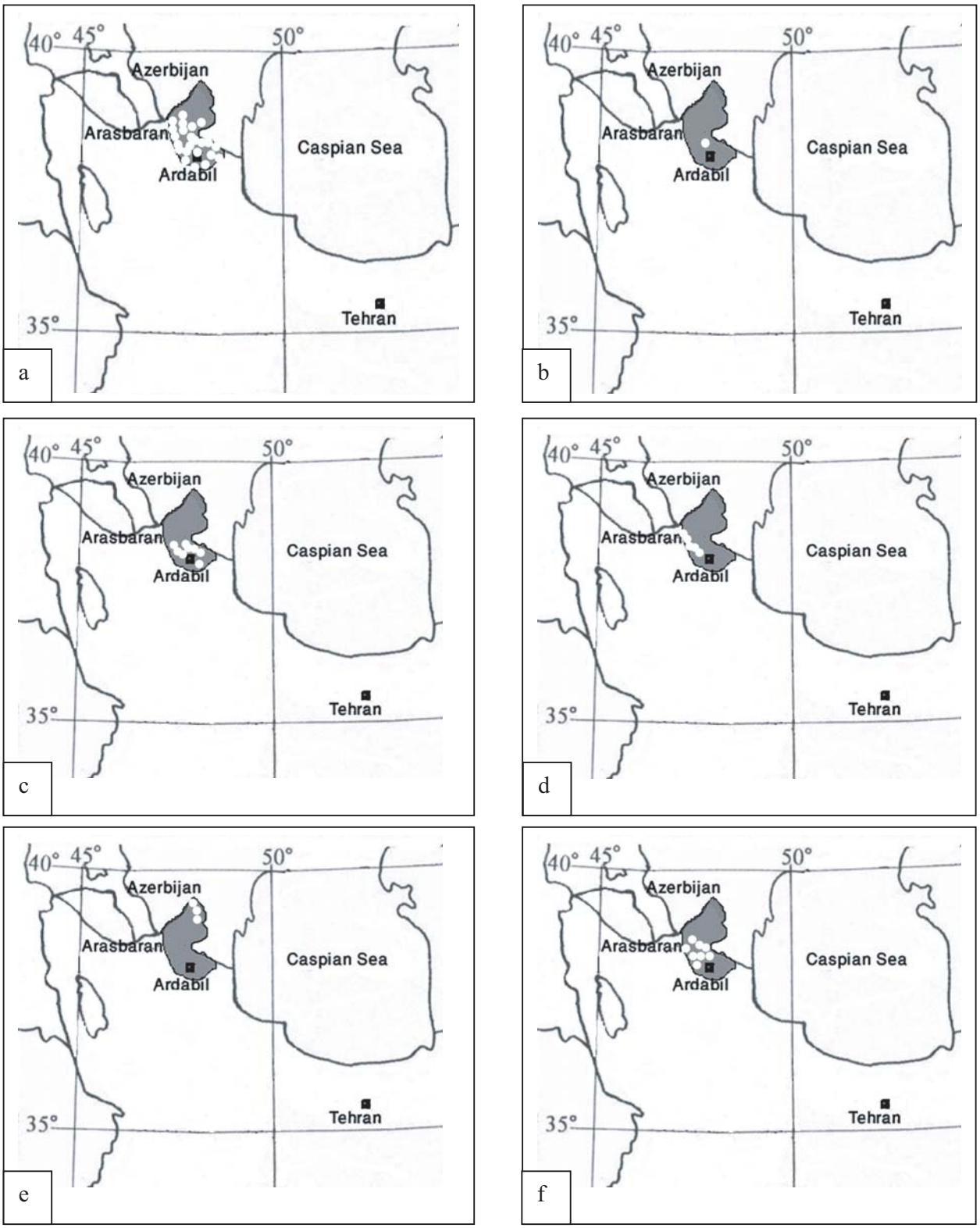

Figure 2. Distribution of species in the study area: (a) *L. caucasia*, (b) *Ph. persicus*, (c) *T. ruderatus*, (d) *P. apodus*, (e) *C. caspium*, (f) *D. raddei.*

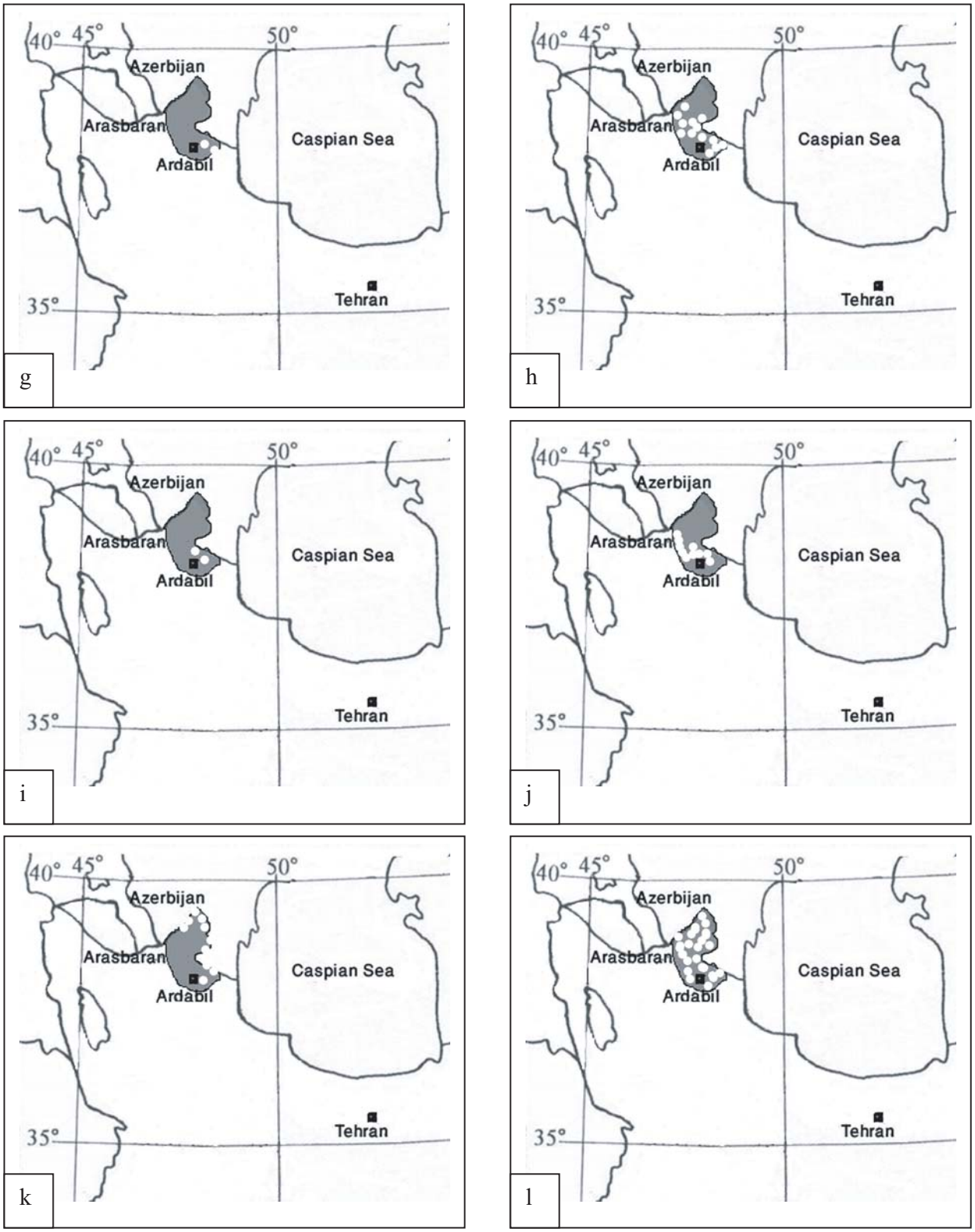

Figure 2. (continued) (g) *E. arguta*, (h) *E. strauchi*, (i) *L. brandtii*, (j) *L. media*, (k) *L. strigata*, (l) *O. elegans.*

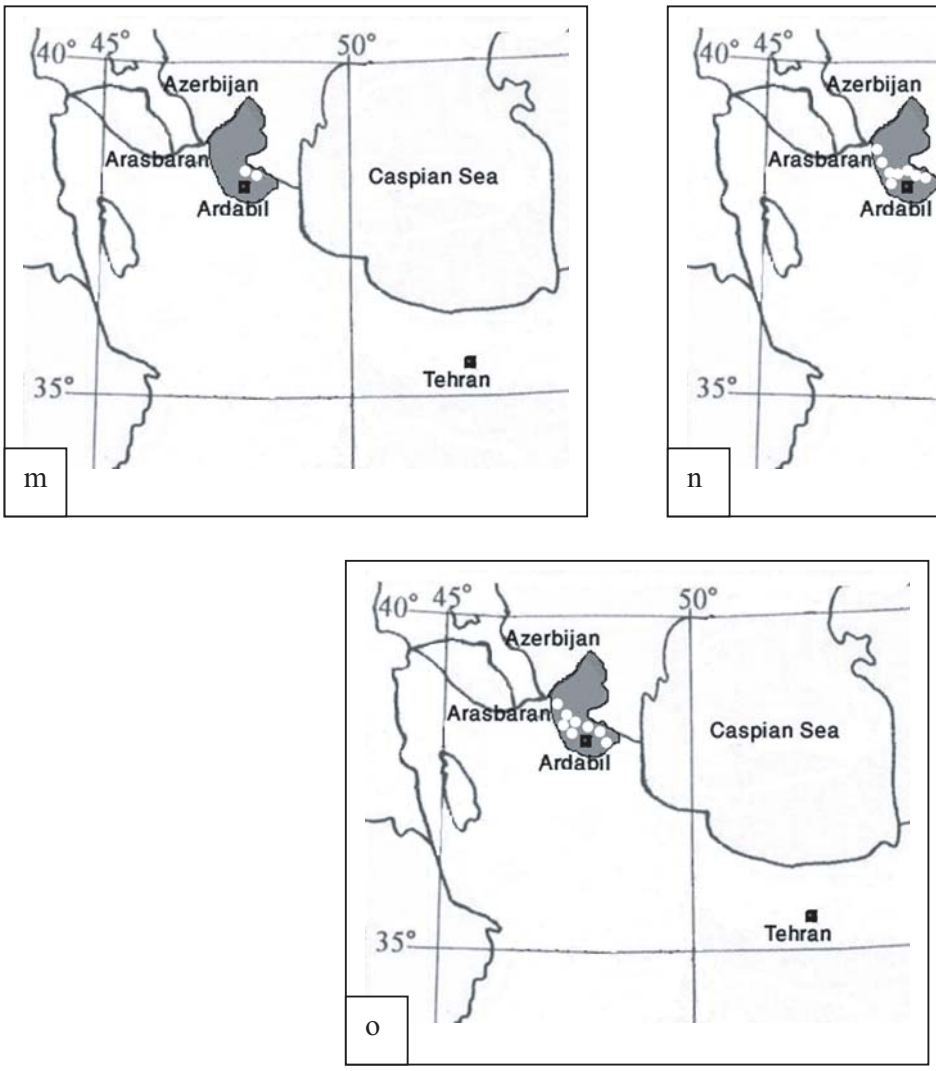

Figure 2. (continued) (m) *A. bivitattus*, (n) *E. schneiderii*, (o) *M. aurata.*

with a 71 mm snout-vent length and had a 128 mm tail. It's olive-gray color pattern does not vary greatly among populations (Fig. 8).

Lacerta media media (Lantz and Cyren, 1902)
Lacerta m. media was very common in the grassy and shrubby areas along the Khyave Chaye and Garesoo river banks. One male specimen was captured under a stone near a bean field. Specimens were observed at an altitude of 2,100 m and males were seen on stony walls near the roads at the end of the winter. The dorsal surface of the adult male, unlike juveniles, was green without any light lines or spots. Females were dark olive-brown with large lateral spots that disappeared with age. The largest lacertid collected during the study was one male specimen with a snout-vent of 117 mm and a tail length of 272 mm. This species exists in two differently-spotted morphs, with specimens from cultivated fields being larger than those from other habitats.

Lacerta strigata Eichwald, 1831
Lacerta strigata was most frequently found in the Hyrcanian Forest in northern Iran and in some bushy and wooded streams banks associated with this forest, such as the Arax River in the northern part of the study area. Large numbers of this species were seen in Pars-Abad, Bilasovar and Germi near streams with dense *Tamarix* and *Rubus* vegetation. One specimen was captured far from the Hyrcanian Forest in an open harvested wheat field on 25 August 2004. Most collection sites represent new locality records. The general color of the dorsum was light green in males and dark-olive to brown in females; it was more strongly spotted than *Lacerta m. media*. Females were also smaller with more numerous dark spots. The largest male had a snout-vent length of 160 mm and a tail length of 100 mm, while the

Figure 3. *Trapelus ruderatus ruderatus.*

Figure 4. *Cyrtopodion caspium caspium.*

Figure 5. *Darevskia raddei raddei.*

Figure 6. *Lacerta brandtii.*

Figure 7. *Eremias arguta.*

Figure 8. *Eremias strauchi.*

Figure 9. *Eumeces schneiderii princeps*.

Figure 10. *Mabuya aruata transcaucasica.*

largest female had measurements of 97 mm and 187 mm.

Ophisops elegans Menetries, 1832
Ophisops elegans is widely distributed, but is most common on the Moghan Steppe. A large isolated population was found in Amir-Abad village. Specimens were active and encountered almost everywhere, particularly in dry stony habitats. Males and females both showed different color patterns during the reproductive period. Dorsal coloration was generally olive-green to brownish with two light dorsolateral stripes that disappear in the adult. An adult female from the Moghan Steppe had a snout-vent length of 64 mm and a tail length of 110 mm, and a male from Amir-Abad village had a snout-vent of 70 mm and a tail length of 120 mm.

Family: Scincidae
Ablepharus bivittatus (Menetries, 1832)
The Two-streaked Snake-eyed Skink, *Ablepharus bivittatus,* has only been found in Amir-Abad village on Ardabil-Germi Road on a slope with large spiny cushion vegetation where it was sympatric with *Ophisops elegans* and *Eremias strauchi*. This active lizard has a high population density in the Neur Lake area in southern part of Ardabil Province reaches. Body coloration on the dorsum and tail is bronze-brown. The largest adult female specimen reached 60 mm in snout-vent length.

Eumeces schneiderii princeps (Eichwald, 1839)
This species lives on sand dunes, stony hills and dry river beds. We captured one male on a foothill in Meshkinshahr on 16 June 2004 at 08:00 AM, where *Mabuya aruata transcaucasica* was also found. This lizard is very active, hides in burrows and can jump approximately 2 m. In comparison to other scincid lizards, *Eumeces schneiderii* occurs in relatively few localities - overgrazing and destruction of habitat is threatening extirpation of this species in the study area. The dorsum was brownish with a narrow creamy-white lateral line from the posterior labial through the ear along the sides to the groin (Fig. 9). Total length (snout-vent + tail length) of the captured male was 240 mm.

Mabuya aurata transcaucasica (Chernov, 1926)
Mabuya aurata transcaucasica lives in sandy areas and small hills that are covered with *Astragalus* and *Acantolimon* vegetation. This lizard often jumps from stone to stone for hunting insects especially grasshoppers. The sympatric occurrence of *Mabuya aurata transcaucasica*, *Darevskia raddei raddei* and *Laudakia caucasia caucasia* has been documented on Salvat Mountain in a rocky habitat. On the Arshagh Mountains, juveniles with blue tails were found in cliffs, but we could not find adult specimens at this locality. Dorsal coloration is olive-brown with dark spots in longitudinal rows. These spots disappear on the tail and head (Fig. 10). In the study area a specimen with a 115 mm snout-vent length and a 125 mm tail was collected.

Literature Cited

Ahmadzaheh, F. 2004. Preliminary studies of the lizard's fauna and their habitats in Meshkinshahr district. Enviromental Sciences 1(2): 39–44.

Anderson, S. C. 1999. The lizards of Iran. Society for the study of Amphibians and Reptiles, 442 pp.

Anderson, S. C. 1996. The turtles, lizards, and amphibians of Iran. Ph.D. Thesis. Stanford University. 660 pp.

Baloutch, M. and H. G. kami. 1995. Amphibians of Iran. Tehran University Publication, Tehran. 177 pp.

Firouz, E. 2000. A Guide to the Fauna of Iran (In persian). Iran University Press, Tehran. 491 pp.

Kami, H. G. and A. Vakilipoure. 1996a. Geographic distribution: *Bufo bufo*. Herpetological Review 27(3): 148.

Kami H. G. and A. Vakilipoure. 1996b. Geographic distribution: *Rana camerani*. Herpetological Review 27(3): 150.

Latifi, M. 1984. The snakes of Iran. Iran Department of the Environment, Tehran. 221pp.

Latifi, M. 1991. The snakes of Iran. Society for the Study of Amphibians and Reptiles. Contributions to Herpetology 7.viii + 159 pp.

Leviton, A. E., S. C. Anderson, K. A. Adler and S. A. Minton 1992. Hand book to Middle East Amphibians and Reptiles. Oxford, Ohio. Vii + 252 pp.

Mertens, R. F. W. 1957. Weitere Unterlagen zur Herpetofauna von Iran 1956. Jahreshefte des Vereins fur vaterlandische Naturkunde in Wurtemberg 112(1): 118–128.

Rastegar-Pouyani, N. 1996. A new species of *Asaccus* (Sauria: Gekkonide) from the Zagros Mountain, Kermanshahan Province, western Iran. Russian Journal of Herpetology 3(1): 11–17.

Rastegar-Pouyani, N. and G. Nilson 1998. A new species of *Lacerta* (Sauria: Lacertidae) from the Zagros Mountain, Esfahan Province, west-central Iran. Proceeding of the California Academy of Science, ser. 4 50(10): 267–277.

Tuck, R. G. 1971. Amphibians and reptiles from Iran in the United State National Museum Collection. Bulletin of the Maryland Herpetological Society 7(3): 48–36.

Tuck, R. G. 1974. Some amphibians and reptiles from Iran. Bulletin of the Maryland Herpetological Society 10: 59–65.

***Submitted**: 07 August 2006*
***Accepted**: 24 August 2007*