

# The Current Status of Korean Lizards (Reptilia: Squamata)<sup>1</sup>

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## 한국산 도마뱀류의 현황<sup>1</sup>

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### ABSTRACT

We reconsidered the taxonomy of lizards in Korea on the basis of morphological characters of collected specimens and previously published data. A total of 138 specimens were used in this study, which were collected from April 1996 to October 2005. From the observations, we presented keys to classify Korean lizards. Also, we indicated sampling sites for each species on the Korean map. In addition, we added some remarks on the distribution of *Gekko japonicus*, the study of genus *Scincella* and the synonym of genus *Takydromus*. Especially, it was uncertain whether the southern Korean peninsula is a natural habitat of *Takydromus tachydromoides oldi* which will be necessary in further study.

**KEY WORDS : LIZARDS, REPTILIA, TAXONOMY, KOREA**

### 요약

한반도 도마뱀류의 지리적 분포와 분류학적 현황을 발표된 자료와 채집된 표본을 이용하여 재고찰하였다. 1996년 4월부터 2005년 10월 사이에 채집된 총 138 개체의 형태학적 특성에 근거하여, 한반도 도마뱀류의 목록표와 종검색표를 제시하였다. 또한 각 종의 채집지를 한반도 지도에 표기하였다. 추가적으로 도마뱀부치(*Gekko japonicus*)의 분포, 도마뱀속(*genus Scincella*)의 연구, 장지뱀속(*genus Takydromus*)의 동종이명(*synonym*)에 대한 견해를 밝혔다. 특히 한반도산 올디장지뱀(*Takydromus tachydromoides oldi*)의 서식 여부에 대해서는 추가적인 연구가 필요하다고 본다.

**주요어 : 도마뱀류, 파충강, 분류, 한국**

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## Introduction

There are approximately 3,000 species of lizards distributed in various temperate and tropical zones (Goin *et al.*, 1978). These lizards consist of many families including Gekkonidae, Scincidae, Lacertidae, Chamaeleontidae etc, which are the primeval groups as opposed to Serpentes (Kang and Yoon, 1975). Gekkonidae is a large group of Lacertilia, which consists of approximately 900 species (Bouer, 1992). Lacertidae consists of approximately 250 species (Harris *et al.*, 1998). Scincidae is the largest family of extant lizards and consists of approximately 1000 species (Zug, 1993).

The first study of Korean reptiles described 3

species (Strauch, 1873). Later, 11 species were recorded by Stejneger (1907) and 24 species were recorded by Shannon (1956) after the Korean War.

The distribution and some morphological characters of Gekkonidae was studied by Stejneger (1907), Okada (1936), Shannon (1956), Kang and Yoon (1975) and Zhao and Adler (1993). The study of Lacertidae was first begun by Stejneger (1907). *Takydromus auroralis* and *T. kwangakuensis* were defined as new species by Doi (1920; 1929) and *T. tachydromoides oldi* is defined as new subspecies by Walley (1958a). Lacertidae was studied by Dixon (1956), Shannon (1956), Kang and Yoon (1975), Hikida (2002), and the biogeography of the *T. wolteri* was studied by Chang *et al.* (2004). Scincidae

**Table 1. The number and surveyed sites of lizards in this study**

Locality	species					
	A	B	C	D	E	F
Mt. Balwang, Pyeongchang-gun, Gangwon-do					1	
Mt. Pukhan, Goyang-si Gyeonggi-do					3	
Mt. Joongwon, Yangpyeong-gun Gyeonggi-do					1	
Mt. Sorak, Gangwon-do					12	
Mt. Bangtae, Inje-gun Gangwon-do			6		10	
Mt. Jeonbong, Yeosu-si, Jeollanam-do					1	
Mt. Kyeryong, Kongju-si, Chungcheongnam-do					3	
Yanggu-gun Gangwon-do					1	
Mt. Gyanggyo, Suwon-si, Gyeonggi-do						1
Anjung-eup, Pyongtaek-si, Gyeonggi-do						2
Jiphyeon-myeon, Jinju-si, Gyeongsangnam-do						1
Mt. Songni, Goesan-gun Chungcheongbuk-do		1				15
Samho-myeon, Yeongam-gun, Jeollanam-do						1
Gumun orom, Jeju-si, Jeju-do						14
Saebyeol orom, Bukjeju-si, Jeju-do						36
Yongju-myeon, Hapcheon-gun, Gyeongsangnam-do						1
Imsil-eup, Imsil-gun, Jeollabuk-do			1			
Hwayang-myeon, Yeosu-si, Jeollanam-do						1
Ip-myeon, Gokseong-gun, Jeollanam-do						1
Hoengseong-eup, Hoengseon-gun, Gangwon-do						1
Daeduk-myeon, Damyang-gun, Jeollanam-do		1				
Wonbuk-myeon, Taean-gun, Chungcheongbuk-do				2		
Daeyeon-dong, Jung-gu, Busan	1					
Mt. Odae, Pyeongchang-gun, Gangwon-do		1				
Seo-myeon, Seocheon-gun, Chungcheongnam-do				1		
Juksan-myeon, Anseong-si, Gyeonggi-do						1
A specimen of unknown locality			2	1	5	7

\* A : *Gekko japonicus*, B : *Scincella vandenburghi*, C : *S. huanrenensis*, D : *Eremias argus*, E : *Takydromus amurensis*, F : *T. wolteri*

was first studied by Mori(1927) and the distribution and taxonomic status of this family was reported by Schmidt(1927), Shannon(1956), Webb *et al.*(1962), Szyndlar(1984; 1991), Ouboter(1986) and Sengoku (1987). Finally Chen *et al.*(2001) reported that two species, *Scincella huanrenensis* and *S. vandenburghi*, exist in Korea. However, there has been relatively little research on Korean lizards.

In this study, we reconsidered the taxonomy of Korean lizards based on morphological characters.

## MATERIALS AND METHODS

A total of 138 specimens were collected from April, 1996 to October, 2005 in Korea(Table 1). Lizards were fixed in 10% formalin and preserved in 70% ethanol in the Ecological laboratory of Kyonggi University (KUEL). Then a detailed examination of morphological characters, such as head shields, keel, femoral pores and ventral scales was carried out. Also, data for the geographical distribution and morphological status of Korean lizards were researched in the literature.

## RESULTS AND DISCUSSION

### A list of Korean lizards

Korean lizards compose three families, four genera and six species. Square brackets means the Korean name.

#### 1. Family Gekkonidae

##### 1. Genus *Gekko* Laurenti, 1768

1. *Gekko japonicus* Dumril and Bibron, 1836 [Domabaembuchi]

#### 2. Family Scincidae

##### 2. Genus *Scincella* Mittleman, 1950

2. *Scincella vandenburghi* Schmidt, 1927 [Miggeundomabaem]
3. *Scincella huanrenensis* Zhao and Huang, 1982 [Bukdomabaem]

#### 3. Family Lacertidae

##### 3. Genus *Eremias* Wiegmann, 1834

4. *Eremias argus* Peters, 1869 [Pyobeom- jangjibaem]

##### 4. Genus *Takydromus* Daudin, 1803

5. *Takydromus amurensis* Peters, 1881 [Amurujangjibaem]
6. *Takydromus wolteri* Fischer, 1885 [Juljangjibaem]

### A key to Korean lizards

1. Top of the head without large and symmetrical shields; smooth tongue; digits greatly expanded along the entire length ..... *G. japonicus*
- Top of the head with large and symmetrical shields(Figure 1) ..... 2

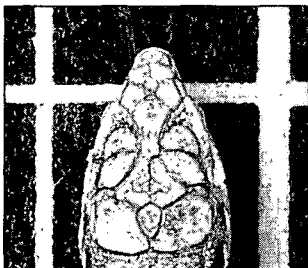


Figure 1. Dorsal view of head. Left. *Eremias argus*, large and symmetrical shields. Right. *Gekko japonicus*, no large and symmetrical shields

2. Ventral scales hexagonal, resembling those of the sides and back; no femoral pores ..... 3  
 Almost square ventral scales, sharply differentiated those of the lateral scales and dorsal scales; femoral pores are present(Figure 2) ..... 4

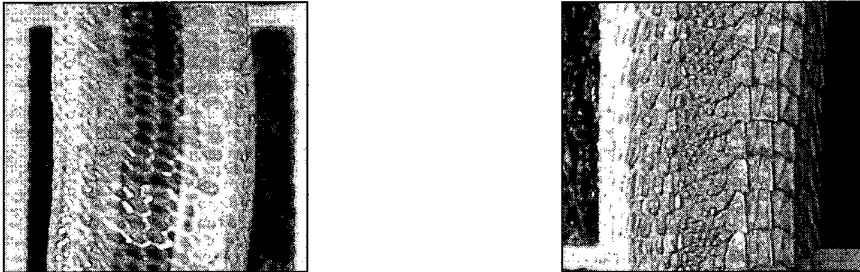


Figure 2. Lateral view of the body. *Left. Scincella huanrenensis*, similar shape of dorsal and lateral scales except color. *Right. Takydromus amurensis*, square and keeled dorsal scales, but granular lateral scales

3. Narrow dorso-lateral stripes with wavy upper margins; slightly enlarged middorsal scales(approximately 1.2 times); forelimbs and hindlimbs touching in the case of females ..... *S. vandenburghi*  
 Broad dorso-lateral stripes with straight upper margins; distinctly enlarged middorsal scales(approximately 1.5 times); forelimbs and hindlimbs never touching(Figure 3) ..... *S. huanrenensis*

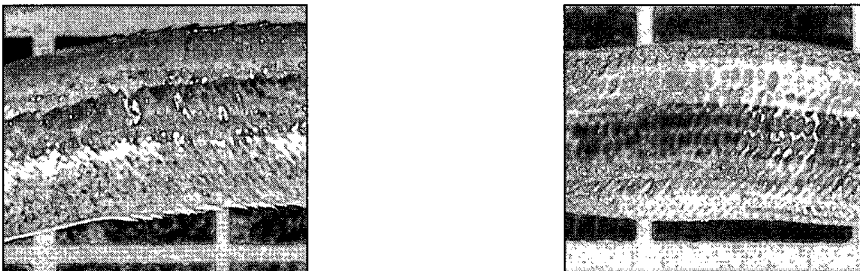


Figure 3. Lateral view of the body. *Left. Scincella vandenburghi*, wavy margins between dorsal scales and lateral scales. *Right. S. huanrenensis*, straight margins between dorsal scales and lateral scales

4. Granular dorsal scales; Ventral scales arranged obliquely; with femoral pores on the thigh; lamella on the underside of the digits keeled ..... *E. argus*  
 Dorsal scales strongly keeled, not granular; with femoral pores in the groin area(Figure 4) ..... 5

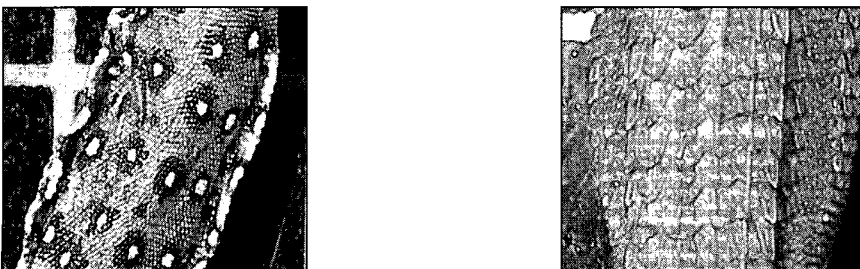


Figure 4. Dorsal view of the body. *Left. Eremias argus*, granular dorsal scales. *Right. Takydromus amurensis*, square dorsal scales

5. Rostral scale contacts frontonasal; 3 or 4 femoral pores on each side; 3 narrow scales by a preanal scale on each side ..... *T. amurensis*  
 Rostral scale separated from the frontonasal by the nasal; 1 femoral pore on each side; 2 narrow scales by the preanal scale on each side; distinct stripe in the lateral sides(Figure 5) ..... *T. wolteri*

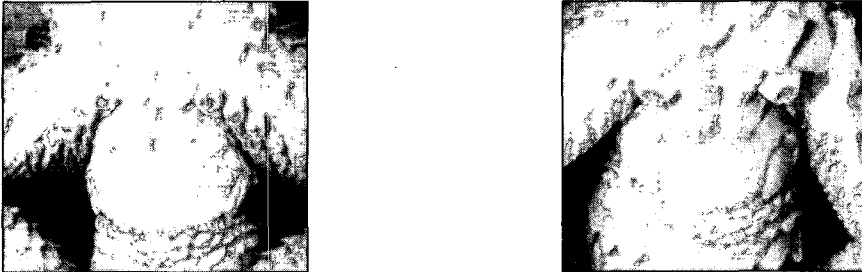


Figure 5. Ventral view of anal region. Left. *Takydromus amurensis*, three femoral pores on each side. Right. *T. wolteri*, a single femoral pore on each side

### Sampling sites in Korea

Based on the sampling data in this study and previous studies, we presented sampling sites of each species on the Korean map(Figure 6).

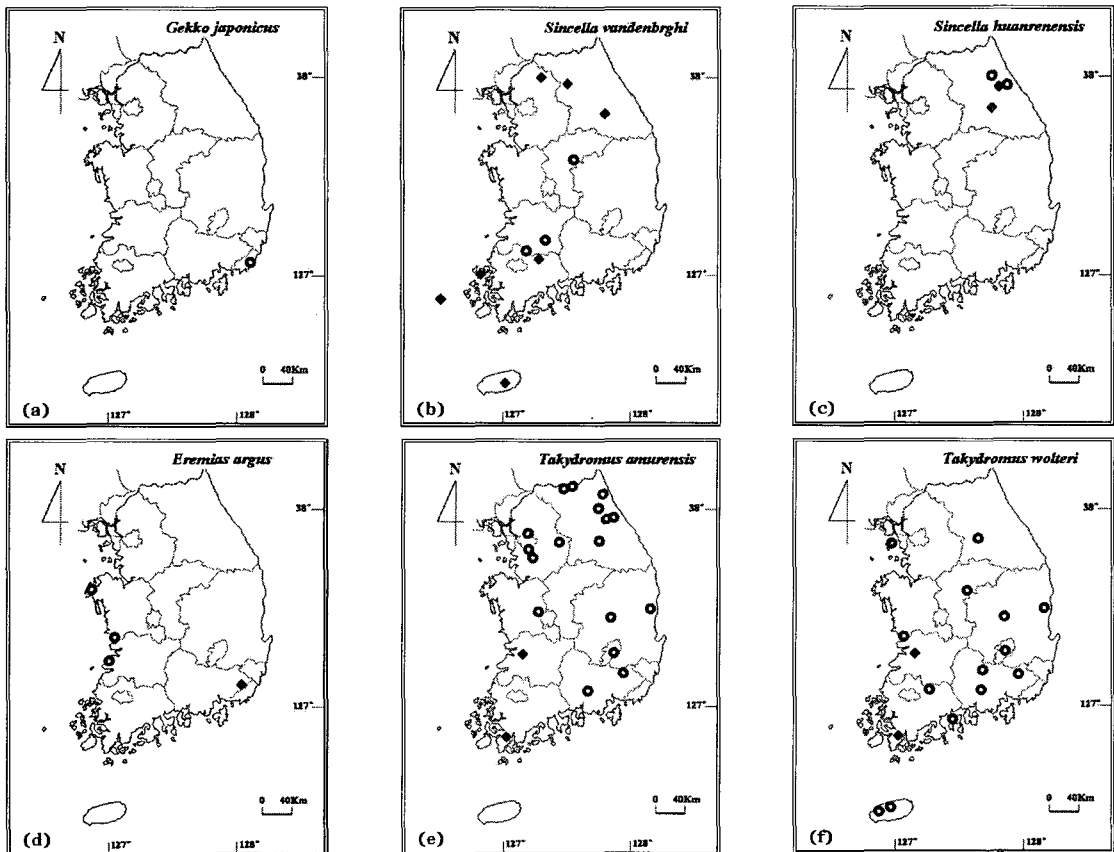


Figure 6. Sampling sites of lizards in Korea (a) = *Gekko japonicus*; (b) = *Scincella vandenburghi*; (c) = *S. huanrenensis*; (d) = *Eremias argus*; (e) = *Takydromus amurensis*; (f) = *T. wolteri*; ■ = sampled in this study; ■ = sampled in previous studies(Chen *et al.*, 2001; Han and Song, 1998, Shim and Kim, 2002; Sin and Cha, 2001)

## Remarks

### (1) Distribution of *Gekko japonicus*

*G. japonicus* was first reported by Stejneger(1907) and then one specimen of this species was collected by Okada(1936). In 1998, *G. japonicus* was reported near Busan during the national survey by the ministry of Korean environment(Han and Song 1998). Lee *et al.*(2004) reported that *G. japonicus* inhabit mainly around the old building, wall and embankment and eat a living arthropod.

### (2) Study of genus *Scincella*

The East Asian population of the genus *Scincella* is known as *Leiolopisma laterale*(= *Scincella lateralis*) of North America during the 19~20 century(Boulenger, 1887; Stejneger, 1907; 1925; Okada, 1939). After studying of the Korean *Scincella* by Mori(1927), Schmidt(1927) compared the Asian populations of *Scincella* with the North American population *Leiolopisma laterale*, as well as two populations such as the Central Chinese and Hainan *Scincella* named for each *S. modesta* and *S. reevesii* respectively. For this reason, the Korean *Scincella* was recorded as *S. modesta* by Ouboter(1986) and *S. reevesii* by Shannon(1956), Webb *et al.*(1962), Szyndlar(1984; 1991) and Sengoku(1987).

Chen *et al.*(2001) reported that two species, *S. huanrenensis* and *S. vandenburghi*, exist in Korea through comparing them with several species, such as *S. lateralis*, *S. modesta*, *S. reevesii*, *S. huanrenensis* and *S. vandenburghi*, but they didn't mention the Korean name of two species. In this paper, we presented the Korean name of two species.

### (3) Synonym of genus *Takydromus*

Korean *Takydromus* is usually identified by several characters: the presence of femoral pores, a chin shield and dorsal scales etc.(Walley, 1962). However, identification of *Takydromus* is very difficult because these morphological characters are variable among individuals. Two species, *T. auroralis* and *T. kwangakuensis*(Doi, 1920; 1929), have been reported as new species, but the same species of the *T. amurensis* described by Walley(1958b; 1962), Lee(1970) and Chang *et al.*(2006). *T. tachydromoides oldi* is known from two specimens said to be distinguishable from a distinct collar of three to four rows of granular scales, keeled ventrals arranged in a reduced number of transverserows, the neck slightly narrower than head, a distinct white collar and uniform chocolate brown ground color. In fact the type comes within the range of Japanese material referred to the nominate form. It was uncertain whether the Korean peninsula is a natural habitat of *T. tachydromoides oldi*(Arnold, 1997).

Therefore, Korean-native *Takydromus* consists of two species of *T. amurensis* and *T. wolteri*(Chang *et al.*, 2006).

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