

A NEW SPECIES OF SKINK, *SPHENOMORPHUS*
TAIWANENSIS FROM TAIWAN
(SAURIA: SCINCIDAE)

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Shyh-Hwang Chen and Kuang-Yang Lue (1987) A new species of skink, *Sphenomorphus taiwanensis* from Taiwan. *Bull. Inst. Zool., Academia Sinica* 26(2): 115-121. This paper describes a newly discovered skink, *Sphenomorphus taiwanensis* sp. nov., in Taiwan. It differs from other skinks found in Taiwan previously, in several morphological features, i. e. body more or less slender, supranasal absent, prefrontals widely separate or just in contact, 4 (rarely 3) pairs of nuchals, 26 (rarely 28) scales around the middle of the body, 15-18 obtuse keeled lamellae beneath the fourth toe, adpressed limbs not or just overlap, without any patch of enlarged scales on the thigh. The closest relatives of this species are *S. courcyanum* and *S. helenae*. The distribution of *S. taiwanensis* ranges from 2200 m to 3200 m above the sea level. The habitat of this new species is also described.

In previous papers (Stejneger, 1910; Wang and Wang, 1956; Wang, 1962; Liu Yu, 1970; Liang and Wang, 1975; Chen, 1984), total 11 species of skinks (Family: Scincidae) were reported from Taiwan. Nevertheless, most of them are very common and widely distribute on the plain and lowland area, except *Eumeces elegans* which was collected by us in one occasion from Tienchi (天池) at the elevation about 2350 m in Kaohsiung county (高雄縣). All other species being reported never reach the higher mountain regions. Recently six specimens of an undescribed species of the skink have been collected from Mt. Hohuan (合歡山), Alishan (阿里山), Patungkuan (八通關), and Mt. Hsiangyang (向陽山) (Fig. 1). The elevation ranges from 2200 m to 3200 m. All the examined charac-

ters are identical with the genus *Sphenomorphus*. Although, *Sphenomorphus* was once deposited as a synonym of *Lygosoma* before (Smith, 1935, 1937; Nakamura & Ueno, 1963), but it still a valid genus (Greer, 1970; Liu Yu, 1970; Chen, 1984) and belongs to the subfamily Lygosominae (Greer, 1970). For this new skink we propose the name *Sphenomorphus taiwanensis* sp. nov.

MATERIALS AND METHODS

This study is based on five mature and one juvenile individuals collected from Mt. Hohuan, Alishan, Patungkuan and Mt. Hsiangyang in Taiwan. All specimens are preserved in 70% ethanol. Measurements and definitions of scales follow Smith (1946). All measurements are defined to nearest 0.1 mm.

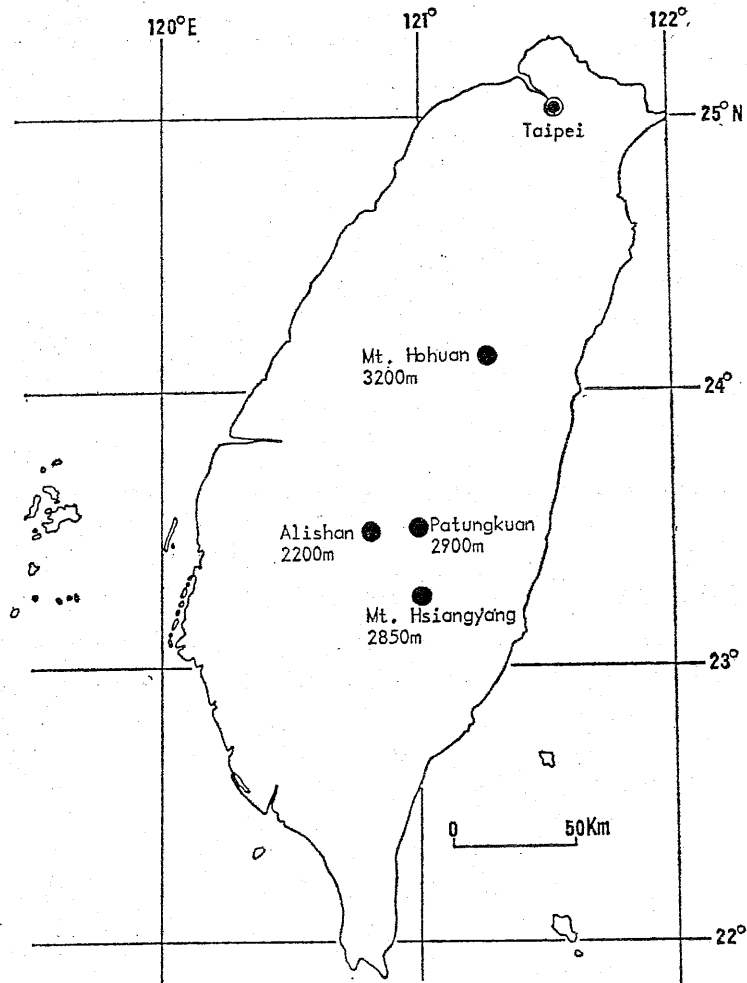


Fig. 1. The locality citations of *Sphenomorphus taiwanensis* sp. nov. found in Taiwan.

RESULTS AND DISCUSSION

Sphenomorphus taiwanensis sp. nov. (Fig. 2)

Holotype: TNUB 148801, an adult male, 50.4 mm SVL (Snout-vent length), collected from Mt. Hohuan (24°8'27''N, 121°16'40''E), Taiwan, about 3200 m above the sea level, on Aug. 16, 1984.

Paratypes: TNUB 148802, an adult female, 58.2 mm SVL, taken on the same date as holotype; TNUB 148601, an adult male, 59.6 mm SVL, collected in Apr. 1985, and TNUB 148701, an adult male, 51.2 mm SVL, collected in July 1984, both specimens were from Alishan, about 2200 m above the sea

level; TNUB 148901, an adult male, 53.2 mm SVL, taken from Patungkuan, about 2900 m above the sea level, in July 1985; TNUB 149101, a juvenile, 24.8 mm SVL, Mt. Hsiangyang, collected from 2850 m above the sea level, in Feb. 1985, by Mr. M. C. Du.

Both holotype and paratypes were collected by Mr. Shyh-Hwang Chen, except TNUB 149101. All were deposited in the museum of the Department of Biology, National Taiwan Normal University, Taiwan, R. O. C. (TNUB).

Diagnosis: Body more or less slender; supranasal absent; prefrontals widely separate or just in contact; 4 (rarely 3) pairs of

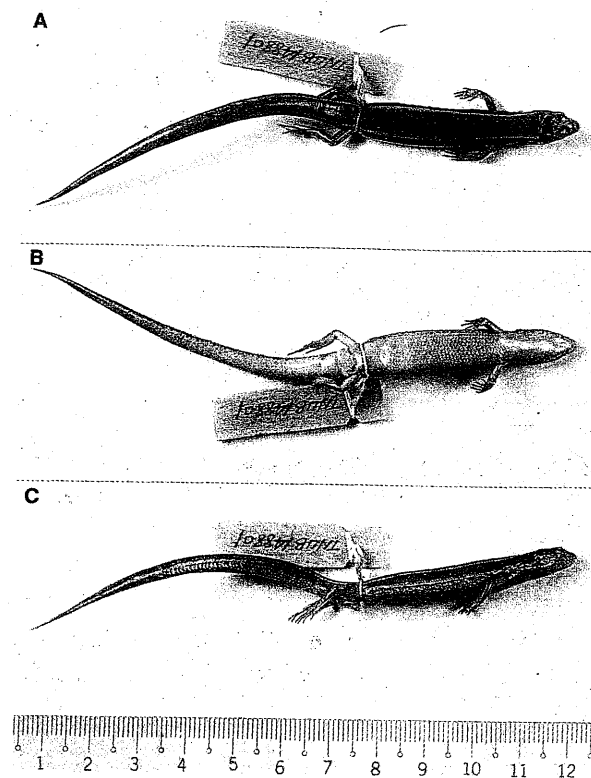


Fig. 2. *Sphenomorphus taiwanensis* sp. nov. (FNUB 148801, holotype)
A. Dorsal view; B. Ventral view; C. Lateral view.

nuchals; 26 (rarely 28) scales around the middle of the body; 15-18 obtuse keeled lamellae beneath the fourth toe; limbs short, adpressed limbs not or just overlap; without any patch of enlarged scales on the thigh.

Description of holotype (Fig. 3)

Palatine bone in contact mesially; pterygoid bone in contact anteriorly; palatal notch not extending forward to the centre between two eyes. Ptergoid teeth absent; maxillary teeth uniform, conical in shape.

Rostral convex, broadly in contact with fronto-nasal, which is broader than the length; prefrontals small, widely separate; supranasal absent; nostril in the centre of the nasal, with a very indistinguishable suture posteriorly to the anterior loreal; no postnasal; left anterior loreal minute, triangular, not in contact with upper labials, but right anterior loreal large, tetragonal, in contact with first

and second upper labials; frontal, pentagonal, narrow behind, in contact with first and second supraoculars, the length shorter than the fronto-parietal and interparietal together; parietals in contact behind the interparietal; 4 pairs of nuchals (4 on the left, 5 on the right), behind the parietals, in contact to form a zigzag-shaped suture, except the first pair; 4 subequal supraoculars; 9 superciliaries; lower eyelid scaly; 7 upper labials, the fifth one just below the middle of the eye, the sixth is the largest, but not longer than the fourth and fifth labials together; 6 lower labials; a single pentagonal postmental, in contact with the first and second lower labials; ear opening sunken, oval to round, no projecting lobules on the border.

Scales on the body, smooth, dorsals and ventrals larger than the laterals; 26 scales around the middle of the body; 2 large pre-anals.

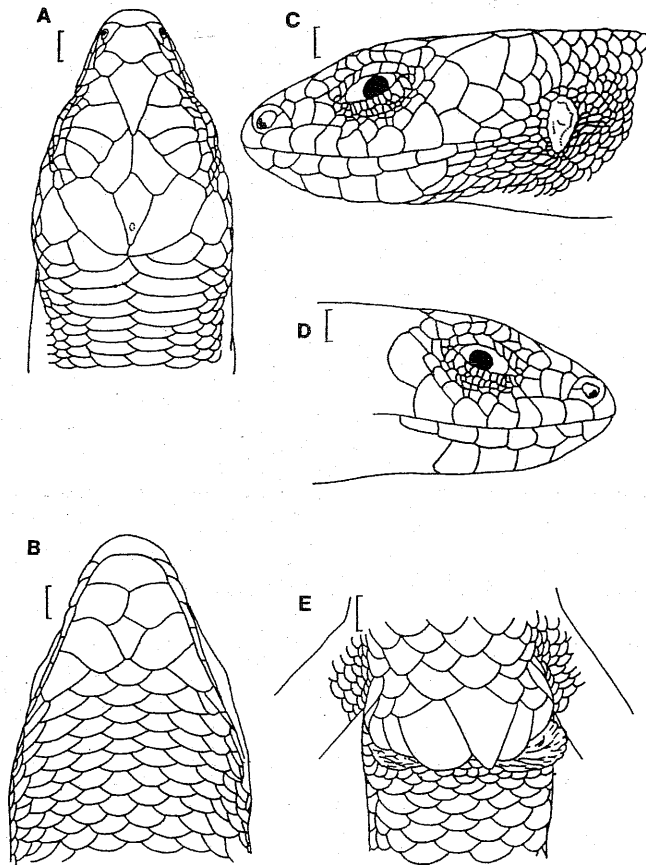


Fig. 3. *Sphenomorphus taiwanensis* sp. nov. All figures were drawn from the holotype. (Scale=1 mm.)

A. Head, dorsal view; B. Head, ventral view; C. Head, left side; D. Head, right side; E. Anal region, ventral view.

Limbs moderate, hind legs about $3/5$ length of the distance from axilla to groin; adpressed limbs just overlap; without any patch of enlarged scales on the thigh; 15-16 obtusely keeled lamellae beneath the fourth toe; the palmar and plantar surface of the hand and foot covered with conical tubercles; without any enlarged scale on the heels.

Tail very strong, cylindric, tapering gradually to a point, with a series of transversely widened plates underneath.

Variation within paratypes

All paratypes with a pentagonal fronto-nasal plate and pointed behind; prefrontals separated or just attached to each other by an angle behind the fronto-nasal; 2 loreals,

anterior loreal minute, triangular, sometimes as large as posterior and tetragonal; nasal in contact with posterior loreal in the condition of bearing the minute triangular anterior loreal. Frontal pentagonal, few with rhomboidal shape. 4 pairs of nuchals, except one specimen (TNUB 148802) from Mt. Hohuan with 3 pairs, the first pair usually not in contact; 8-9 superciliaries, most 9, only two cases with 8 superciliaries in total ten counts; ear opening oval to round, relatively large, without any projecting lobule on the border; 26 scales around the middle of the body, except TNUB 148901 from Patungkuan with 28 scales.

Hind legs about $1/2$ to $2/3$ length of the distance from axilla to groin; adpressed limbs

not or just overlap; 15-18 obtusely keeled lamellae beneath the fourth toe.

Tail very strong, tapering gradually to a point, with a series of transversely widened plates underneath, especially on the regenerating part.

Colour in life: Dorsal, dark brown to olive brown, with minute black spots arranged in three longitudinal lines, the median line always indistinct; a broad dark brown strip on the dorsolateral side from the tip of snout to tail, which is bordered with a narrow indistinct whitish strip, just above and below this brown strip; on both flanks, under this border, mottled with dark brown spots to form a relatively indistinctive band. Throat white; ventral of abdomen and tail yellow or yellowish green.

Measurements: Measurements in mm. and expressed in hundredths of SVL were shown below. (Table 1)

Ethymology: The name *taiwanensis* of this new species was based on the island where this new species was collected.

Distribution: Mt. Hohuan, Alishan, Patungkuang, and Mt. Hsiangyang. It seems that this new skink is a very rare species but distributes widely in the central part of Taiwan at the elevation above 2200 m.

Habitat: Specimens of *Sphenomorphus*

taiwanensis were collected from various habitats. Animals were found on the relatively dry rocky shoulders of the road in Mt. Hohuan and Mt. Hsiangyang. In Patungkuang and Mt. Hohuan, they moved along the edge of the open grassland, where *Yushania niitakayamensis* is the dominant plant species. Finally, two animals in Alishan was found on the border of the field of *Wasabia japonica* and the floor of the coniferous forest where the humidity is relatively high. All animals were discovered during the daytime. It seems that *S. taiwanensis* is diurnal, living close to the surface of the ground. We never found this skink climbing on the tree bark or on the top of shrubs.

Comparisons with closely related species

According to the morphological study, *Sphenomorphus taiwanensis* is closely related to *S. indicus* (= *Lygosoma indicum*), *S. boulengeri* (= *L. boulengeri*), *Scincella formosensis* (= *Leiolopisma laterale formosensis*) and *Dasia smaragdina* from Taiwan. *S. indicus* possesses 34-37 scales (most 34 scales) around the middle of the body in our specimens, while Smith (1935) had counted 30-38 scales which is larger than ours; enlarged nuchal plate absent to one pair, many specimens (about 1/3) have only one nuchal plate; frontal in contact with anterior three (rarely two) supraoculars, the suture between frontal and

TABLE 1
Measurements and body proportions of the type series
of *Sphenomorphus taiwanensis* sp. nov.

	Measurements (mm)			in Snout-vent length (%)		
	Holotype	Paratypes (n=5)		Holotype	Paratypes (n=5)	
		range	mean±s. d.		range	mean±s. d.
Snout-vent length	50.4	24.8-59.6	49.4±12.7			
Tail length	70.0	36.8-89.6	54.3±31.0	139	100-168	137±28
Head length	9.6	5.8-11.2	9.3± 2.0	19.0	14.1-23.4	19.6± 3.4
Head width	7.0	4.2- 7.6	6.6± 1.2	13.9	11.4-16.9	13.8± 1.9
Axilla-groin length	28.8	13.2-36.0	28.3± 8.3	57.1	52.6-61.2	56.7± 3.6
Fore-leg length	12.4	6.8-14.0	12.2± 2.8	24.6	21.3-27.4	25.2± 2.4
Hind-leg length	17.2	8.8-19.6	16.9± 4.1	34.1	31.6-37.9	34.8± 2.5

third supraocular is very short. While *S. boulengeri* has more scales around the middle of the body (36-40 scales), no nuchal (rarely 1 pair), more lamellae under the fourth toe (22-27 lamellae), and with a patch of enlarged scales on the thigh. These characters are different from *S. taiwanensis*, which has 26-28 scales around the middle of the body, 4 pairs of nuchals, frontal in contact with anterior two supraoculars. Without any transparent disk on lower eyelid, *S. taiwanensis* can be separated easily from *Scincella formosensis*. It seems that *D. smaragdina* is very rare in Taiwan. We do not have the chance to examine any specimen of it, While Stejneger (1910) pointed out that *D. smaragdina* bears an enlarged scale on the heel, with 33 subdigital lamellae beneath the fourth toe, frontal in contact with anterior three supraoculars, 3 pairs of nuchals, and rather slender of fore and hind-legs. These were different from *S. taiwanensis*.

By the way, *S. taiwanensis* is also closely allied to *S. courcyanum* (= *L. courcyanum*) from Assam of India, Tibet of China, and *S. helenae* (= *L. helenae*) from central part of Siam. Unfortunately we also have not the chance to examine the specimens of them. However, *S. courcyanum* without any nuchal plate, with fewer lamellae (12-13 lamellae) beneath the fourth toe; and *S. helenae* with 3 pairs of nuchals, 30 scales around the middle of the body. Both species can be distinguished easily from *S. taiwanensis*. The comparisons among these allied species are shown in Table 2.

Specimens examined: The following specimens are used in present work to compare with *Sphenomorphus taiwanensis* sp. nov.

Sphenomorphus indicus: 16 specimens. Taipei: Wulai (TNUB-A179, A180, F001, D196, D198), Yangmingshan (TNUB-A240), Hsintien (TNUB-C031, C032). Nantou: Shuili

TABLE 2
The comparison on the external features among
Sphenomorphus taiwanensis and its allies

Taxa	Lower eyelid	Pairs of enlarged nuchals ¹⁾	Supraoculars in contact with frontal	Scales around the middle of the body	Lamellae underneath the 4th toe	Enlarged scales on heel	Enlarged scales on the thigh
<i>Sphenomorphus taiwanensis</i> (n=6)	scaly	4 (5) rarely 3(1)	2 pairs	26 (5) rarely 28 (1)	15-18 (10) most 15-16(8)	absent	absent
<i>Sphenomorphus indicus</i> (n=16)	scaly	0-1	3 pairs (15) rarely 2 (1)	34-37 (16) most 34 (10)	18-22 (27)	absent	absent
<i>Sphenomorphus boulengeri</i> (n=10)	scaly	absent (9) rarely 1(1)	2 pairs (9) rarely 3 (1)	36-40 (10) most 38 (6)	22-27 (18)	absent	present
<i>Sphenomorphus courcyanum</i> (Smith, 1935)	scaly	absent	2 pairs	26	12-13	?	?
<i>Sphenomorphus helenae</i> (Smith, 1935)	scaly	3	?	30	16-22	?	?
<i>Scincella formosensis</i> (n=2)	a transparent disk	3-4	2 pairs	27	14-18 (4)	absent	absent
<i>Dasia smaragdina</i> (Stejn., 1910)	scaly	3	3 pairs	20-26	33	present	?

¹⁾ (n) represent the sample size.

(TNUB-A235), Chitou (TNUB-A241). Chiayi: Chuchi (TNUB-030201, 030202). Tainan: Kwangtzuling (TNUB-A177, A178). Pingtung: Nanjenshan (TNUB-A181). Taitung: Chihpan (TNUB-A239).

Sphenomorphus boulengeri: 10 specimens. Pingtung: Nanjenshan (TNUB-A182, F185, E649). Taitung: Chialan (TNUB 148301), Chihpan (TNUB-A236), Lanyu (TNUB 050701-04, 130801).

Scincella formosensis: 2 specimens. Pingtung: Nanjenshan (TNUB-E650, E749).

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臺灣蜥蜴之一新種——臺灣蜓蜥 (*Sphenomorphus taiwanensis*)

(蜥蜴亞目：石龍子科)

陳世煌 呂光洋

臺灣蜓蜥 (*Sphenomorphus taiwanensis*) 爲臺灣產石龍子科之新種，發現於海拔 2200~3200 公尺之中南部山區。其主要特徵爲身體細長；無鼻上鱗，前額鱗分離或僅以一角隅相接，下眼瞼覆滿細鱗，頂鱗之後具有 4 對頸鱗；環繞體軀中部一周有鱗片 26 (稀 28) 列；四肢短小，前後肢相向緊貼體側時不重疊或正好重疊，股部後下方沒有一區大形而排列不規則的鱗片，後肢第四趾下面有 15~18 枚趾下鱗，可與本科其他近似種相區別，但外形上以 *S. courcyanum* 和 *S. helena* 與本新種較爲類似。其棲息環境在文中亦加以描述。

