ZOOLOGICAL SCIENCE **24**: 496–503 (2007)

Description of Male *Takydromus sylvaticus* (Squamata: Lacertidae) from China, with Notes on Sexual Dimorphism and a Revision of the Morphological Diagnosis of the Species

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The Chung-an ground lizard, *Takydromus sylvaticus*, long known only from five females collected in Fujian Province of China, was recently found in Anhui Province of the country. The newly collected specimens included the first male specimens (n=7), in which the tail bases were stouter than in conspecific females. Ventral scales in these males were invariably keeled, whereas in females those forming the four median rows were smooth. Females had more dorsal scales (47–48) than males (42–43) in the median longitudinal row between axilla and groin. *Takydromus sylvaticus* differed from the closely related *T. dorsalis* in having more dorsal scales in the median longitudinal row between axilla and groin (42–48 versus 32–40, respectively), more rows of large dorsal scales between the hind legs (10 versus 7–8, respectively), shorter hind legs, two distinct white longitudinal stripes on each side of the body, and no black stripe in the preocular and postocular regions. The number of transverse rows of ventral scales between collar and femoral pores in *T. sylvaticus* (26–28) was larger, but with a slight overlap, than that in *T. dorsalis* (22–26). Ecological observations on *T. sylvaticus* were also documented.

Key words: *Takydromus sylvaticus*, *T. dorsalis*, *Platyplacopus*, *Apeltonotus*, sexual dimorphism, ground lizard

INTRODUCTION

The Chung-an ground lizard, *Takydromus sylvaticus*, is one of the most enigmatic lizards in China. The first five specimens (types) of this lacertid species, all females, were collected in 1926 from Chung-an County (currently known as the Wuyishan region), Fujian Province, China (Pope, 1928) (Fig. 1). Pope (1929) stated that this species was unpredictably distributed at the type locality and extremely rare or absent elsewhere. Until recently (Tang and Xiang, 2002), there were no records of additional specimens or biological observations of this species, making the existence of this green lacertid lizard a kind of mystery (Zhao and Liu, 1999). The discovery of this species in southern Anhuei Province (Fig. 1) is important to the understanding of lizard diversity in China.

Because *Takydromus sylvaticus* shared characteristic small dorsal scales exclusively with *T. dorsalis* of the Ryukyu Islands, Japan, Pope (1928) described an independent genus, *Apeltonotus*, to accommodate both of these species (also see Pope, 1929). However, he later synonymized this genus with *Platyplacopus* Boulenger 1917 (Pope, 1935). In his phylogenetic studies using morphological characters, Arnold (1989, 1997) reduced the rank of *Platyplacopus* to a subgenus of *Takydromus* Daudin, 1802, but Zhao and Liu (1999), after comparing representative specimens of *Platyplacopus* and *Takydromus* sensu Pope (1935), argued for the validity of *Platyplacopus* as a full genus on the basis of its distinctness in toe structure from *Takydromus* sensu stricto. Based on molecular data, Lin *et al*. (2002) and Ota *et al*. (2002) inferred phylogenetic relationships of the genus *Takydromus* sensu Arnold (1997), and negated the validity of *Platyplacopus* (and *Apeltonotus*) at any taxonomic level.

Among the *Takydromus* lizards, *T. sylvaticus* and *T. dorsalis* are considered to be morphologically similar to and phylogenetically most closely related to each other (Arnold, 1997; Chou *et al*., 2001; Ota *et al*., 2002). They are distinguished from the other congeners by having small, keeled dorsal scales on the forebody that are not in obvious longitudinal rows and by 8–10 rows of large scales between the hind legs (Arnold, 1997).

In 2000, *Takydromus sylvaticus* was discovered from

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doi:10.2108/zsj.24.496

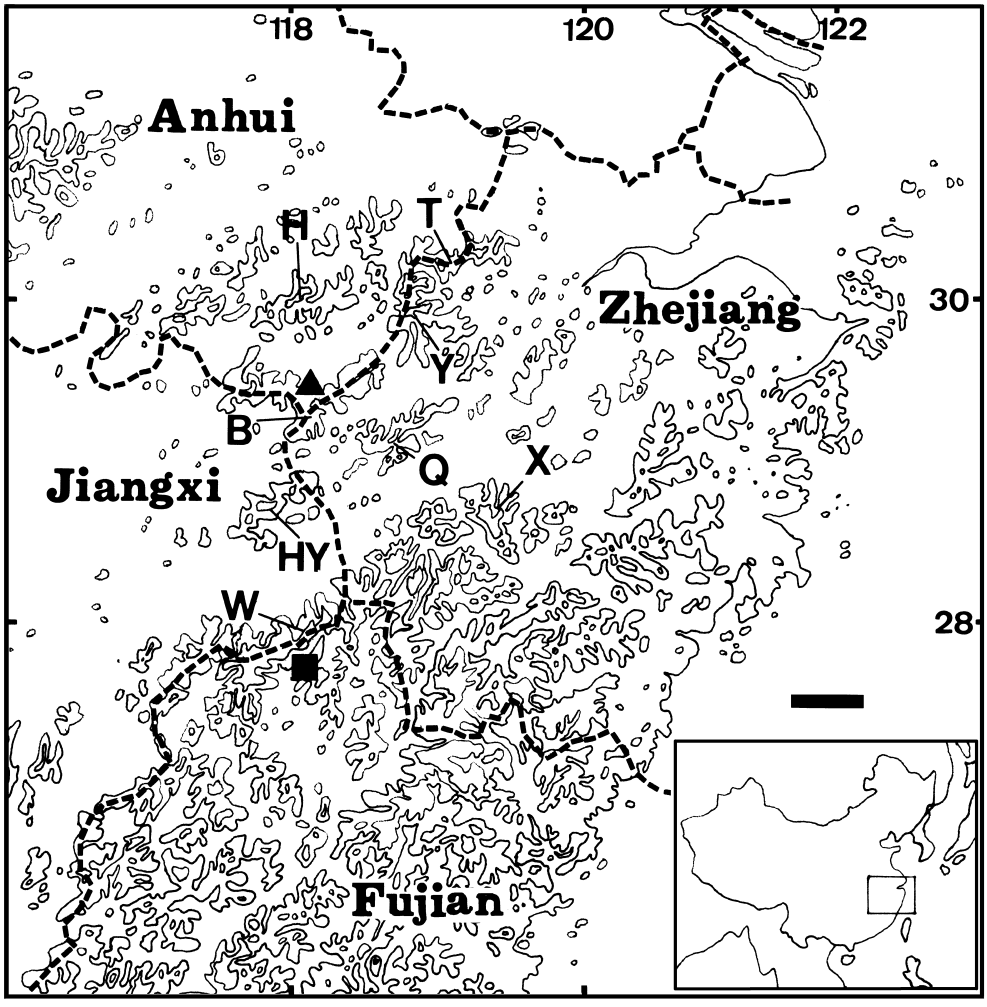

Fig. 1. Map of mountainous regions in Anhui, Zhejing, Jiangxi, and Fujian Provinces, China. Rivers and lakes are omitted. Type (■) and additional specimens (▲) of *Takydromus sylvaticus* were found in Fujian and Anhui, respectively. Mountain ranges that should be surveyed for *T. sylvaticus* are Baijishan (**B**), Huangshan (**H**), Huaiyushan (**HY**), Qianligang (**Q**), Tianmushan (**T**), Wuyishan (**W**), Xianxialing (**X**), and Yuling (**Y**). Scale bar=50 km. Broken lines are provincial borders. Contour lines are at 0, 500, and 1000 m above sea level.

Anhui Province, China. Since then, a few reports have been published on the natural history and phylogeny of this population (Tang and Xiang, 2002; Tang and Wang, 2005; Tang and Chen, 2006). However, information regarding their morphological characters has not yet been appropriately provided. In this paper, we provide a detailed morphological description of the newly collected specimens. We also examine sexual dimorphism in *T. sylvaticus*, compare morphological features with those of its putative sister species, *T. dorsalis*, in detail, and revise the diagnosis of the species accordingly.

MATERIALS AND METHODS

Specimens of *Takydromus sylvaticus* (HS000512, 10101, 30101, 30102, 40101, 40102, 40501, 40502, 50201, 50301, and NMNS 4334) were collected in a recovering subtropical forest and adjacent bamboo plantation (29.45°N, 118.15°E) near the Lingnan Nature Reserve, Xiuning County, Anhui Province, China. The reserve is located west of the Baijishan Range that lies on the border of Zhejiang, Jiangxi, and Anhui Provinces (Fig. 1). Specimens of *T. dorsalis* were collected from Iriomotejima (NMNS 3452: two specimens whose field numbers are f4568 and f4569), Kuroshima (KUZ 216, 217, and 540), and Ishigakijima (KUZ 45, 46, and R62236-239) of the Ryukyu Islands. All specimens were fixed in 10% formalin before preservation in 70–80% EtOH. Terminology for the description of scale and other characters followed Arnold (1997) and Zhao and Liu (1999). The following measurements were taken to the nearest 0.1 mm with dial calipers: snout-vent length (from tip of snout to anterior margin of vent), tail length (from posterior margin of vent to tip of tail), head length (from tip of snout to anterior margin of ear opening), head width (distance between broadest points), foreleg length (from axilla to tip of fourth finger excluding the claw), hind leg length (from groin to tip of fourth toe excluding the claw), and axilla-groin length (distance between axilla and groin). Using log-transformed values as input data and SVL (snout-vent length) as the covariate, analysis of covariance (ANCOVA) were performed using the GLM procedure in SAS (SAS Institute Inc, 1988) to evaluate sexual differences in these characters in *T. sylvaticus* and their interspecific differences between *T. sylvaticus* and *T. dorsalis*. Museum acronyms NMNS, HS, and KUZ represent the National Museum of Natural Science (Taichung, Taiwan), Huangshan University (Anhui, China), and the Kyoto University Zoological Collection (Kyoto, Japan), respectively.

RESULTS

Diagnosis

Takydromus sylvaticus differs from *T. dorsalis* in having more dorsal scales in the median longitudinal row between axilla and groin (42–48 versus 32–40), more rows of large dorsal scales between the hind legs (10 versus 7–8), and two distinct white longitudinal stripes on each side of the body. *Takydromus* dorsalis has a black stripe extending from the preocular region posteriorly through eyelid margin to the anterior edge of ear opening, whereas *T. sylvaticus* lacks this stripe.

Description of male *T. sylvaticus*

Based on specimens HS030101, HS030102, HS040101, HS040102, HS040501, HS050301, and NMNS 4334 (Figs. 2 and 3). Head elongate, length/width ratio ranging from 1.78 to 2.07 (mean=1.92). Snout acutely pointed. Rostral scale nearly hemispheric, mostly visible dorsally, contacting median frontonasal scale. Median frontonasal scale nearly hexagonal; length greater than width, contacting a pair of prefrontal scales posteriorly. Prefrontal scales also contacting each other medially. Frontal scale nearly hexagonal, slightly keeled; anterior end wider than posterior end. Length of frontal scale greater than width; similar to the distance from anterior end to tip of snout. Four supraocular scales on each side; middle two bigger than others. Anterior supraocular scale length much greater than width. Posterior supraocular scale wider than long. Supraciliary scales 4 or 5, narrow. A series of tiny supraciliary granules between supraciliary and supraocular scales. A pair of frontoparietal scales posterior to frontal scale contacting medially. Two parietal scales, weakly keeled, bordered laterally by 4–5 scales distinctly larger than neighboring granular scales, separated by interparietal scale and 1–3 small scales behind it.

Nearly rhombus-shaped, the nasal scales extended to dorsal snout without joining; nostril opening in the middle. The lower edges of nasal scales contact the supralabial scales. Two loreal scales posterior to each nasal scale; anterior scale shorter than posterior scale. Eyes moderate in size; pupils round. Lower eyelids covered by scales. Several small preocular and postocular scales present. Subpreocular scale oblong, below front corner of eye, posterior to the posterior loreal scale. Anterior edge of this subpreocular scale in contact with the posterior edge of the posterior loreal scale; lower edge in contact with the 4th and 3rd supralabial scales; posterior edge in contact with anterior edge of 5th supralabial scale.

Area between eyes and ear openings covered with granular scales. Ear openings rounded, smaller than eye diameter. Except for 1–3 small, narrow scales, anterior edges of ear openings mostly bordered by granular scales. Six supralabial scales; 5th scale largest. Anterior edge of mental scale rounded; posterior edge level. Six infralabial scales, anterior five scales elongate, lengths 4–6 times the widths; 6th shortest, length approximately one-third that of 5th, nearly rectangular in shape. Four pairs of chin shields, increasing in size from anterior to posterior; entire length of anterior two pairs contacting medially. The 3rd pair of chin shields, anterior halves contacting, increasingly separated by granular scales. Other ventral cranial scales ordered, with smooth granular scales gradually changing at neck to large, keeled scales behind line joining posterior edges of ears. Collar with 9–12 scales in transverse row. Other dorsal cranial scales slightly larger with stronger keeling than lateral scales; ordered lengthwise, not in obvious rows, shifting gradually to granular scales on side of body. With 42–48 scales in longitudinal row across middle of back between axilla and groin. On belly, 26–28 transverse rows of imbricate, large, keeled scales in six longitudinal rows between collar and femoral pores. Among these rows, scales in the four median rows slightly larger than those in two outer rows.

Limbs slim. Digits long and thin; tips thinner than other sections. Bases of tip sections especially flat, forming an angle to other sections. Each digit equipped with claw and broad subdigital lamellae. Fourth toe with 25–27 subdigital lamellae. Scales on dorsal surfaces of arms enlarged and keeled; ventral scales smooth on lower arms and granular on upper arms. Anterodorsal thigh scales enlarged and keeled, larger than adjacent keeled scales, becoming smaller and granular posteriorly. Smooth and enlarged ventral thigh scales in one row, middle one at least ten times as large as adjacent rounded or granular scales posteriorly. Dorsal tibia scales small and keeled; ventrolateral tibia scales smooth, enlarged in one row, each at least twice as large as adjacent scales. Vent opens transversely. Preanal scale not divided by longitudinal suture (except in specimen HS030102). Continuous series of smaller scales in semicir-

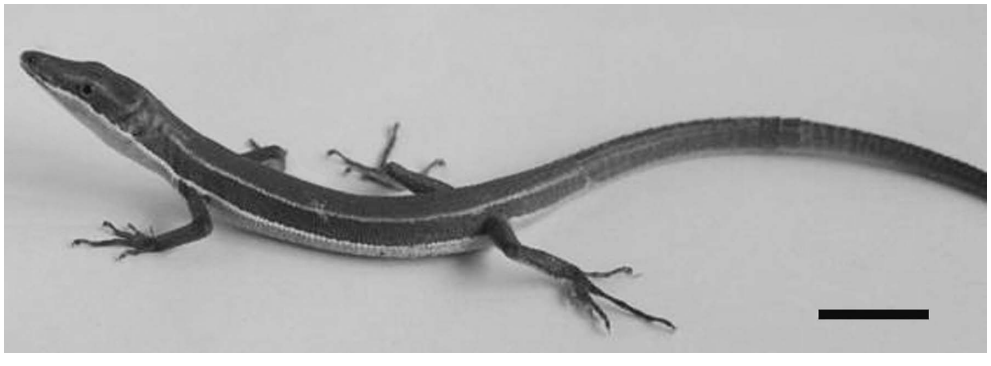

Fig. 2. Male *Takydromus sylvaticus* in life (HS 030102; SVL=56.5 mm). Scale bar=10 mm.

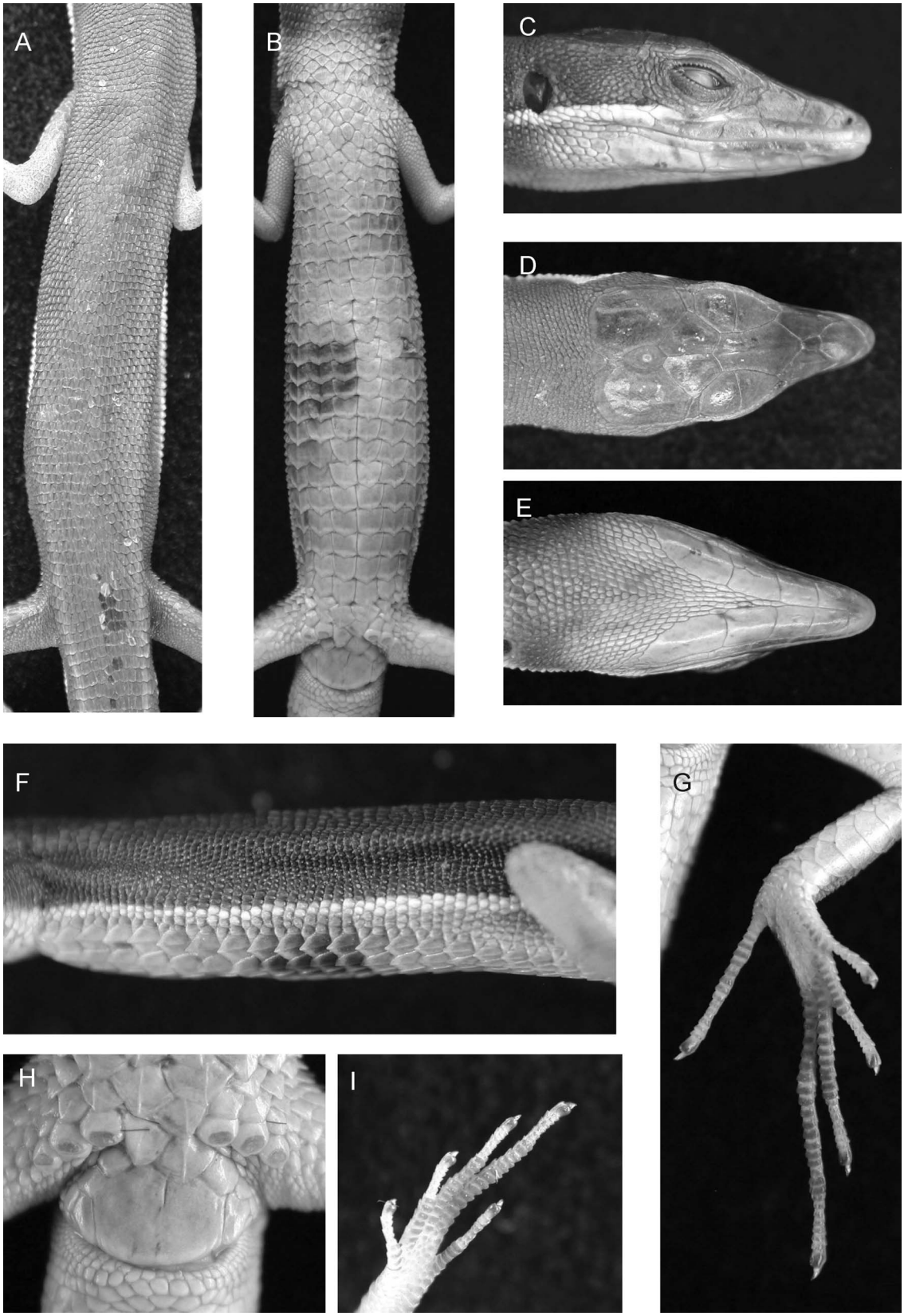

Fig. 3. Male *Takydromus sylvaticus* specimen (NMNS 4334; SVL=44.8 mm). **(A)** Dorsal view of body; **(B)** ventral view of body (axilla-groin length=22.2 mm); **(C)** lateral view of head (head length=11.4 mm); **(D)** dorsal view of head (head width=6.4 mm); **(E)** ventral view of head; **(F)** lateral view of body; **(G)** ventral view of toes (fourth toe length=7.6 mm); **(H)** ventral view of preanal and anal regions showing femoral pores and preanal scales (width at tail base=4.2 mm); **(I)** ventral view of fingers (fourth finger length=5.5 mm).

cle surrounding preanal scale. Long, thin tail covered by keeled large scales looping into rings. Tail stout at base and near base. Three pairs of femoral pores present.

Alive (Fig. 2), *T. sylvaticus* had golden pupils, green back (emerald green immediately after shedding of skin), lighter green belly, darker green on sides between two light longitudinal stripes. Upper stripe, thin and yellowish green, from pileus along common border of dorsal and lateral scales to dorsolateral sides of tail. Lower stripe, broader and white, from lower side of rostral scale between eye and upper lip to lower edge of ear opening above shoulder to base of hind leg. Reddish brown lateral sides of head from snout to lores. Reddish brown forelegs (except for proximal third of upper arms), knee, and toes.

After preservation in 10% formalin, the back of *T. sylvaticus* specimens turned blackish green. The upper longitudinal stripes faded after three months in solution. The lower stripes remained clearly visible. With preservation in 80% alcohol, specimens turned pale: the back turned bluish green; the belly turned pale green and white; both longitudinal stripes remained clearly visible; the forelegs turned dark brown, except for green on the upper arms; the hind legs (thigh and tibia) stayed pale green; and the toes turned dark brown.

Sexual dimorphism

We found no significant differences in coloration between males and females. All ventral scales of males were keeled. In females, the medial four rows of ventral scales were smooth, with keels occurring only on outermost rows. Females had more scales in the median dorsal longitudinal row between axilla and groin than the males (47–48 vs. 42–43, respectively). Visually, the proximal section near tail base in males was stouter than in females. Appendix I lists measurements of *T. sylvaticus*. The ANCOVA tests showed no statistical differences (P>0.05) for head length, head width, foreleg length, hindleg length, and axilla-groin length (Table 1). Tail length was not tested due to the small number of specimens having intact tails.

Ecology

Little information regarding the natural history of this species is available. The collection site of *Takydromus sylvaticus* in the mountains of Anhui Province is a recovering subtropical evergreen forest adjacent to a village. The forest is dominated by Fagaceae (*e.g*., *Castanopsis sclerophylla*, *Cyclobalanopsis glauca*, and *Quercus glandulifera* Bl. var. *brevipetiolata*) and Theaceae (*e.g*., *Camellia sinensis*, *Eurua rubiginosa*, and *E. muricata*). The undergrowth is composed of scattered dryopteridacean ferns (*e.g*., *Polystichum makinoi* and *Dryopteris bissetiana*). Most lizards were collected on the ground or rocky slopes immediately outside the forest. Villagers owning the adjacent plantation of the bamboo *Phyllostachys edulis* (Gramineae) told us that they had unearthed hibernating *T. sylvaticus* from holes between rocks or underneath bamboo roots when they were harvesting bamboo shoots in winter and early spring (January–March).

On sunny November afternoons, the lizards came out to feed, apparently preparing for hibernation. Hibernation ended in early April. The lizards were alert and swift, running away very quickly from enemies and disturbance. They were never found on trees. In the laboratory, captive lizards fed on small locusts, geometrids, lycaenid butterflies, spiders, and pill-bugs.

Shortly after hibernation, a female *T. sylvaticus* was brought to the laboratory. She successively deposited four clutches, with 4, 2, 2, and 2 eggs, respectively, from mid-May to late July 2000. Three dissections of males were made in April 2000. Testes measurements were 5.4×2.7 mm and 5.3×2.8 mm (HS030102), 5.1×2.5 mm and 5.1×2.6 mm (HS040301), and 5.0×2.0 mm and 5.1×2.4 mm (HS050301). Right testis in front, with left about half a testis length behind right. Testes light yellow and oval-shaped. Specimen HS040301 had two light yellowish, broad, bean-shaped fat bodies: 7.2×4.8×2.1 mm (left) and 7.7×5.0×1.9 mm (right). We did not make sperm smears. The reproductive cycle of *T. sylvaticus* awaits future studies.

Table 1. Results of ANCOVA tests for sexual dimorphism in characters of adult *Takydromus sylvaticus* and for interspecific differences between *T. sylvaticus* and *T. dorsalis*.

Characters	Mean±SD (Range)		F	*P*
Between sexes of *T. sylvaticus*	Male (N=5)	Female (N=4)		
Snout-vent length	53.0±1.1 (51.9–56.5)	55.8±3.4 (51.1–58.9)		
Head length	14.0±0.5 (13.2–14.7)	14.2±0.5 (13.6–14.9)	<.01	0.98
Head width	7.2±0.3 (6.9– 7.6)	7.3±0.3 (6.9– 7.6)	<.01	0.97
Foreleg length	20.1±1.3 (18.6–21.9)	19.9±1.3 (18.1–21.0)	0.85	0.40
Hind leg length	26.4±1.4 (24.7–27.9)	26.5±1.5 (24.4–27.7)	0.35	0.58
Axilla-groin length	26.3±0.9 (25.5–27.6)	28.4±2.2 (25.7–30.6)	0.78	0.42
Between *T. sylvaticus* and *T. dorsalis*	*T. sylvaticus* (N=9)	*T. dorsalis* (N=10)		
Snout-vent length	54.2±3.0 (51.1–58.9)	63.8±6.6 (59.9–71.3)		
Head length	14.1±0.5 (13.2–14.9)	15.5±1.5 (12.9–16.9)	0.84	0.37
Head width	7.2±0.3 (6.9– 7.6)	8.7±0.9 (7.3– 9.7)	2.85	0.11
Foreleg length	20.0±1.1 (18.1–21.9)	23.9±2.3 (18.3–26.2)	1.78	0.20
Hind leg length	26.4±1.3 (24.4–27.9)	34.3±3.0 (29.9–35.9)	28.77	<.01
Axilla-groin length	27.2±1.8 (25.5–30.6)	30.5±3.8 (25.1–36.4)	9.94	<.01

Mensural differences from *T. dorsalis*

Measurements of *T. dorsalis* are listed in Appendix I. ANCOVA tests showed significant differences in hind leg length and axilla-groin length ($P<0.01$) between adult *T. sylvaticus* and *T. dorsalis* (Table 1). *Takydromus sylvaticus* had shorter hind leg length and axilla-groin length. There were no sifnificant differences in head length, head width, or foreleg length ($P>0.05$).

DISCUSSION

The phylogeny of the genus *Takydromus* as derived from morphological data revealed that *T. sylvaticus* and *T. dorsalis* are sister groups (Arnold, 1997; Chou *et al*., 2001; Ota *et al*., 2002). This was confirmed genetically by mtDNA data (Tang and Chen, 2006). These two species are morphologically very similar, and they can be collectively distinguished from other congeners by the presence of very small dorsal scales in irregular longitudinal placement on the forebody (Arnold, 1997).

To diagnose *T. sylvaticus*, Pope (1928, 1929) stated, "*T. sylvaticus* differs from *T. dorsalis* in having a less distinct collar, much shorter limbs, more scales across the middle of the back, a greater number of transverse series of ventral plates, and a distinctive color pattern." We confirmed some of these diagnostic characters. For example, we observed that *T. sylvaticus* has more dorsal scales across the middle of the body between axilla and groin, shorter hindlegs (but not forelegs; Table 1), and clear white lines along each side of the body. On the other hand, *T. sylvaticus* lacks preocular and postocular black stripes that are present in *T. dorsalis* (Stejneger, 1907). There is overlap in the range of collar scale number between *T. sylvaticus* (9–12) and *T. dorsalis* (10–12). We also found that both species have equally developed collars and gular scales, with the enlarged keeled median scales not extending anteriorly to level of ear openings. Although we showed that *T. sylvaticus* has a greater number of transverse rows of ventral scales between the collar and femoral pores than *T. dorsalis* (26–28 versus 22–26, respectively), as emphasized by Arnold (1997), the number overlaps. Arnold (1997) also indicated that *T. dorsalis* has one postnasal scale and three femoral pores on each side, but *T. sylvaticus* has two postnasal scales and two femoral pores. The 2–3 femoral pores (Pope, 1929; our data) and the one postnasal scale of *T. sylvaticus* (our data) are different from Arnold's (1997) observation. Therefore, counts of postnasal scales, counts of ventral scales, development of the collar, and number of femoral pores are probably not reliable characters for distinguishing *T. sylvaticus* from *T. dorsalis*.

Current methods of preserving specimens cannot prevent changes in coloration, thus biasing descriptions of coloration. All 11 specimens of *T. sylvaticus* had two longitudinal stripes in life. Specimens faded within one week after fixation in 10% formalin and preservation in 80% alcohol, a result similar to that for the green *T. hani* (Chou *et al*., 2001), but both stripes remained visible. Three months of preservation in 10% formalin, however, turned the back of specimens a blackish green and blurred the upper stripes, leaving only the lower stripes visible (Fig. 3). Pope's (1928, 1929) descriptions did not mention the upper body stripes of *T. sylvaticus* and the black stripes in the preocular and postocular regions of *T. dorsalis*. We consider these stripes important diagnostic characters for distinguishing *T. sylvaticus* from *T. dorsalis*.

Sexual dimorphism, broadly occurring in reptiles, is frequently represented by size, coloration, display organs, fighting structures, trophic structures, and scale counts. In *Takydromus* species, the difference is expressed in color (Lin and Cheng, 1990; Takeda and Ota, 1996), shape (Stejneger, 1907; Arnold, 1997; Ji *et al*., 1998; Zhao and Liu, 1999), and size (Stejneger, 1907; Arnold, 1997; Ji *et al*., 1998). Our observation of seven males and four females of *T. sylvaticus* showed that the cranial scales of males and females are similar, distinct intersexual color patterns are absent, and body size ranges have broad overlap (Table 1). We noticed that the proximal section near the base of the tail in males is stouter than in females, and that females have more scales in the median longitudinal row across the back between axilla and groin.

We found that all male *T. sylvaticus* have keeled ventral scales. In females, the medial four rows of ventral scales are smooth, with keels only on the outermost rows. In the five type specimens, all female, Pope (1929) illustrated that one had keeled ventral scales and the rest had smooth ventral scales with faint or distinct keels in the outermost rows. The keeling of ventral scales seems not to be a reliable character for distinguishing sex in this species. Keeling is stronger in male *T. sylvaticus* and may also reflect differences in adaptation. Keels on ventral scales may function to maintain the position of climbers on trees (Arnold, 1997). We observed no behavioral or ecological differences between male and female *T. sylvaticus*, not even in tree climbing. Tanaka (1986) frequently observed ground and arboreal microhabitat use by *T. dorsalis* for foraging, basking, and resting. On our 11 specimens of *T. dorsalis*, the ventral scales of both sexes were smooth, and only the outermost rows had more-or-less discernible keels. This implies that frequent climbers, such as *T. dorsalis*, do not necessarily need the help of keels on their ventral scales to maintain position when climbing.

Since a second population of *T. sylvaticus* was found in Anhui in 2000 (Tang and Xiang, 2002), 74 years after the species was first described, the future of *T. sylvaticus* has brightened. The re-discovery of *T. sylvaticus* has three implications. First, the new population is located in the mountainous region on the border of Jiangxi and Anhui Province, on the edge of the Ningnan Nature Reserve in Anhui Province. Although farmlands are scattered throughout this region, there are still fragments of well-conserved secondary forests. That a population of *T. sylvaticus* survived at this location was probably related to the fact that the ecosystem was not drastically altered. Conservation efforts should include avoiding farmland expansion and preserving the habitat of the species.

Second, the location of the rediscovery is about 200 km from the Wuyi Mountain Range of Fujian Province, where *T. sylvaticus* was originally described. The area between these locations also consists of mountain ranges. Pope (1928) collected *T. sylvaticus* from Guaduen in the Wuyi Mountain Range, in a subtropical forest 1200–1500 ft in elevation. This sort of vegetation occupies all the regions between Guaduen and the site of rediscovery. This vegetation also

extends to similar elevations in the Huangshan Mountains of Anhui Province (Zhang, 1999). Previous censuses of species diversity in Huangshan did not detect *T. sylvaticus* (Tang *et al*., 2002). More surveys are needed to determine whether the Lingnan Nature Reserve is the northern border of the range of *T. sylvaticus*. Nevertheless, this new discovery has revised the geographic distribution of *T. sylvaticus* from a point to a stripe. The actual distribution of *T. sylvaticus* may cover elevations between 1200–1500 ft in the mountains at the junction of Fujian, Zhejiang, Jiangxi, and Anhui Provinces. The Xianxialing, Huaiyushan, Qianligang, Yuling, and Tianmushan mountain ranges (Fig. 1) deserve more attention.

Third, *T. sylvaticus* is one of China's rare reptiles. The Anhui population gives biologists a chance to solidify the conservation of this species by studying its population biology, ecological behavior, habitat selection, reproductive biology, and genetic diversity, and the effects of a changing environment.

ACKNOWLEDGMENTS

We thank the anonymous villagers who collected *Takydromus sylvaticus* specimens, T-E Lin and S-L Chen for their help in collecting *T. dorsalis* in the Ryukyu Islands, H. Ota for the loan of specimens under his care, Cara Lin Bridgman for critical reading of the early manuscript, two anonymous reviewers for comments on earlier versions of this manuscript, and E-M Zhao for providing literature. The project was sponsored by grants from 1) the Natural Science Fund (2004kj329) and Teaching and Research Fund (2005311), Department of Education of Anhui Province to X-S Tang; 2) the Travel Fund for Research in Mainland China (2005), Ministry of Education, Taiwan, to W-H Chou, and 3) the National Science Council Fund (NSC88-2311-B-178-004) for a collecting trip to the Ryukyu Islands to W-H Chou.

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(Received April 18, 2006 / Accepted November 14, 2006)

Appendix I. Measurements of *Takydromus sylvaticus* from Lingnan, Anhui Province, China, and of *T. dorsalis* from the Ryukyu Archipelago, Japan. (unit: mm).

Specimen No.	Sex	Snout-Vent Length	Tail Length	Head Length	Head Width	Foreleg Length	Hind Leg Length	Axilla-Groin Length
T. sylvaticus								
NMNS 4334[1]	♂	44.8	154.5	11.4	6.4	16.4	22.1	22.2
HS030101	♂	53.6	147.3	14.7	7.1	20	25.8	26.8
HS030102	♂	56.5	148.5	14.2	7.6	20.1	27.1	27.6
HS040101	♂	51.9	19.9[2]	13.9	7.4	19.9	26.7	25.6
HS040102	♂	52.6	198.6	14.1	7.1	21.8	27.9	26.1
HS040501[1]	♂	36.3	116.3	9.9	5.1	14	18.7	18.8
HS050301	♂	50.6	11.8[2]	13.2	6.9	18.6	24.7	25.5
HS000512	♀	55.8	154.4	14.2	7.2	9.7	26.2	27.6
HS010101	♀	51.1	81.2[2]	13.6	6.9	18.1	24.4	25.7
HS040502	♀	58.9	217.4	14.9	7.6	21	27.7	29.7
HS050201	♀	57.3	78.1[2]	14.1	7.4	20.8	27.6	30.6
T. dorsalis								
NMNS f4569	♀	71.3	208.2	16.8	9.2	26.2	37	34.8
KUZ 46	♀	64.3	199.8	14.6	8.3	22.9	34.3	32.6
KUZ 540	♀	71	220.6	15.7	9.4	25.2	34.9	36.4
NMNS f4568	♂	59.9	117.5[2]	15.2	8	24.1	31	27.9
KUZ R62236	♂	64.2	231.5	16.9	9.4	24.6	34.8	28.9
KUZ R62237	♂	62	211.2	16.3	8.6	24.9	33.3	29.1
KUZ R62238	♂	54.7	125	13.1	7.4	22	31.3	25.9
KUZ R62239[1]	♂	43.5	124.2	11.1	6.7	16.4	23.3	20.9
KUZ 45	♂	52.6	135.2	12.9	7.3	18.3	29.9	25.1
KUZ 216	♂	68.1	206.1	16.7	9.3	25.8	40.1	30.6
KUZ 217	♂	70.3	118.5[2]	16.8	9.7	25.1	35.9	34.1

[1]Juvinile or subadult
[2]Tail damaged