

Hamadryad Vol 24, No 1, pp. 39 – 42, 1999
 Copyright 1999 Centre for Herpetology
 Madras Crocodile Bank Trust

**Comments on the grass lizards
 (Lacertidae: *Takydromus*)
 of Vietnam and Myanmar**

(with two text-figures)

According to Bobrov (1995) and Nguyen and Ho (1996), two species of grass lizards are known to occur in Vietnam: *Takydromus sexlineatus* and *T. wolteri*, which are also reported to occur in sympatry (Darevsky et al., 1986). Ziegler et al. (1998) were able to record for the first time a representative of the subgenus *Platyplacopus* for Vietnam: *T. kuehnei*, which proved to be a new subspecies after comparisons were made with the Chinese populations (Ziegler and Bischoff, in press). Moreover, Ziegler and Bischoff (in press; see also Ziegler et al., 1998) demonstrated that some of the Vietnamese records of *T. wolteri* were based on misidentified *T. kuehnei* and also *T. sexlineatus*, and therefore the occurrence of the otherwise strictly Palearctic *T. wolteri* in northern Vietnam must be seriously doubted. *T. kuehnei* has been found only in northern Vietnam, while *T. sexlineatus* is distributed all over

the country (see Bobrov, 1995; Nguyen and Ho, 1996), and is assigned by most authors (Dao, 1979; Darevsky et al., 1986; Bobrov, 1992; Bobrov, 1995; Zhao and Adler, 1993) to the subspecies *ocellatus*. As was already mentioned by Ziegler et al. (1998), Bourret recorded in his unpublished manuscript "Les lézards de l'Indochine" (1942-1947) not only *T. sexlineatus ocellatus* for the entire "Indochine française", but also the nominotypic subspecies for South Vietnam ("Cochinchine"). If sympatry of *T. sexlineatus ocellatus* and *T. s. sexlineatus* is established, their subspecific status would be no longer tenable.

In the course of our investigation on Vietnamese *Takydromus* material, it turned out that all specimens of *T. sexlineatus ocellatus* from Vietnam had partially regenerated tails which, in addition, were relatively short in the specimens from northern Vietnam - from the south only ZFMK 38316 was accessible to us. The same was true for specimens of *T. sexlineatus ocellatus* from Hainan, whereas the specimens from southern continental China clearly showed longer and unregenerated tails (Table 1). Externally, in most cases hardly discernible, regenerated tails- characterized by smaller, more

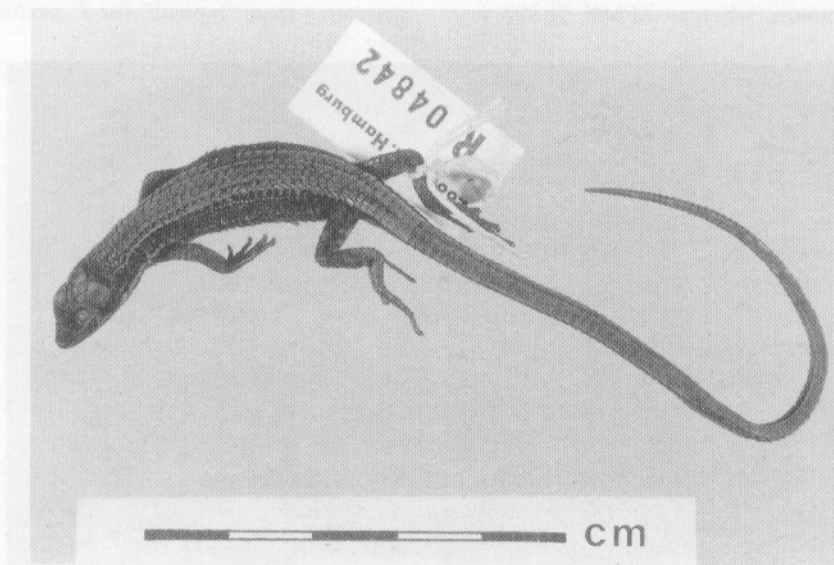


FIGURE 1: Dorsal view of the questionable *Takydromus* specimen, ZMH R04842 (SVL 47 mm, TL 108 mm) from Myanmar. Photo: J. Köhler.

weakly keeled scales with different colouration—were further examined by x-ray, to verify the cartilaginous cord that replaces the vertebral column.

In view of the fact that the tail in *Takydromus sexlineatus* can be five times longer than the snout-vent length (see Boulenger, 1921) and has an important locomotory function, the short tails caused by an obviously high autotomy readiness in *T. sexlineatus* from northern Vietnam and from Hainan are remarkable, because, on account of the long tail in *T. sexlineatus*, the shift of the centre of gravity behind the body towards the tail base is normally advantageous for locomotion in specific habitat, viz. high grasslands (De Rooij, 1915; Smith, 1935; Hauschild, 1986; Arnold, 1997). Therefore, the question arises whether these specimens with obviously shorter tails are possibly adapted to other habitat structures. According to Bobrov (1992), *T. sexlineatus ocellatus* in southern Vietnam inhabits “places with abundant grass cover and sunshine-plantings, light forests or grasslands. The highest abundance of *T. s. ocellatus* are marked in young *Hevea* plantings”. Both MTKD specimens (37908-9) were, according to the information given on their labels, collected in the open countryside at Cuc Phuong National Park in northern Vietnam, whereas ZFMK 70352 was

collected at bushy wayside vegetation in cultural landscape (J. Hnizdo, in litt.). Also, both specimens from Hainan were not found in high grasslands, the otherwise typical habitat for *T. sexlineatus*: ZFMK 61732 was collected in 700-800 m above msl in a clearing with sparse vegetation and isolated tufts of grass; and ZFMK 61754 at a relatively open *Hevea* plantation with sparse undergrowth at the edge of the forest (P. Heimes, pers. comm.).

The autotomy-induced, shorter tails of specimens from northern Vietnam and Hainan are most probably caused by predation, and the reasons for this obviously higher autotomy readiness are of great biological interest. Arnold (1984; 1988) assigned species with reduced tail autotomy to three groups, the third group of which (species with specialized locomotion in dense vegetation) fits well with *Takydromus sexlineatus*. Apart from individual differences in the autotomy ability (e. g., temperature, embryonic development) according to Arnold (1988), only “interspecific variation in the readiness with which the tail is shed” is known. Therefore, the case of infraspecific variation in autotomy readiness mentioned herein raises most interesting questions: if the populations of North Vietnam and Hainan are adapted to other biotope structures than “typical” for *T. sexlineatus* and



FIGURE 2: Lateral view of the head of ZMH R04842. Photo: T. Ziegler.

TABLE 1: Snout-vent lengths (SVL), total tail lengths (TL), regenerated parts of tail (R) and SVL:TL ratios of the investigated specimens of *Takydromus sexlineatus ocellatus*. MTKD: Staatliches Museum für Tierkunde Dresden; SMF: Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt a. M.; ZFMK: Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn. All measurements in mm.

	SVL	TL	R	SVL:TL
MTKD 37908 (male) Vietnam, Ninh Binh Province, Cuc Phuong	54	40	23	1.35
MTKD 37909 (male) Vietnam, Ninh Binh Province, Cuc Phuong	57	169	55	0.34
ZFMK 70347 (female) Vietnam, Nghe An Province, Tan Ky	47	106	tail tip	0.44
ZFMK 70348 (female) Vietnam, Nghe An Province, Tan Ky	57	85	52	0.67
ZFMK 70349 (male) Vietnam, Thanh Hoa Province, Quan Hoa	53	144	60	0.37
ZFMK 70350 (male) Vietnam, Thanh Hoa Province, Quan Hoa	55	117	96	0.47
ZFMK 70351 (female) Vietnam, Nghe An Province, Ky Son	49	140	68	0.35
ZFMK 70352 (male) Vietnam, Nghe An Province, W Tuong Duong	43	117	56	0.37
ZFMK 38316 (male) Vietnam, Kon Tum Province, Buen Loi	65	268	65	0.24
ZFMK 61732 (male) China, Hainan, Wuzhishan	52	131	89	0.40
ZFMK 61754 (female) China, Hainan, Nada	50	97	65	0.52
SMF 11878 (male) China, Guangxi-Zhuang Province, Nanning	49	214	-	0.23
SMF 11879 (female) China, Guangdong Province, Canton	55	227	-	0.24

are therefore autotomizing their tails easier and more often, this would indicate an important infraspecific evolutionary divergence, which, in the case of a beginning speciation process, would certainly be of greater significance ("selection target") than possibly correlated subtle morphometric differences (see, Böhme, 1978). The only secondarily (i. e., due to regeneration) relatively shorter tails of the populations of northern Vietnam and Hainan could nonetheless indicate a beginning speciation process, i. e., a subspecific differentiation in *T. sexlineatus*. Field studies at further geographical sites and investigation of more material are needed to test the hypothesis.

During our examination of preserved *Takydromus* material, we further found a specimen in the Zoologisches Museum, Universität Hamburg (ZMH), labelled as *Takydromus sexlineatus* from Rangoon (= Yangon, Myanmar) (ZMH R04842, leg. 6. VIII. 1906, Schwinghammer, ded. 12. X. 1906). For Myanmar, the taxa, *Takydromus (T.) khasiensis*, *T. (T.) s. sexlineatus* and *T. (T.) sexlineatus ocellatus* are currently known (Smith, 1935; Biscoff, 1992; Arnold, 1997). However, the above mentioned specimen (Fig. 1, 2) was not assign-

able to any of these forms. According to the key provided in Arnold (1997), it rather fits *Takydromus (T.) tachydromoides*, which is restricted to Japan (and perhaps South Korea). Also first comparisons with specimens of *T. tachydromoides* from Japan (ZFMK 7050, 8378-8386, 8970-8972, 22548, 22549, 26519, and 26520) did not contradict such an identification. Because all documents such as receipt books or catalogues have been destroyed in Hamburg during World War II, only the above-mentioned information on the label of the original jar (old number 3060) is left (J. Hallermann, in litt.). Although erroneous locality data seem to be the most plausible explanation in this case, we would not like to rule out the possibility of an overlooked *tachydromoides*-like *Takydromus* taxon in Myanmar and urge resident herpetologists to draw their attention in the course of field studies and on preserved material. Should such a form be discovered in the future, it would most likely not be conspecific with the Japanese form.

We thank Jakob Hallermann (ZMH), Peter Heimes (México City), Jan Hnizdo (Gießen), Hoang Xuan Quang (Vinh University), and Vo Quy (Hanoi National University) for their sup-

port. Klaus Busse kindly took the x-rays, Jörn Köhler (ZFMK) took Figure 1. For the loan of material, we wish to thank Jakob Hallermann (ZMH), Gunther Köhler (SMF), and Uwe Fritz (MTKD). The German-Vietnamese cooperation project between ZFMK and the Universities of Hanoi and Vinh is financially supported by the Volkswagen Foundation (project no. I/72 843). Field studies of T. Ziegler in Vietnam were supported by a grant of the "Graduiertenförderung" (GrFG NW, no. 1 26 10) in combination with a grant of the German Academic Exchange Service (DAAD, No. 213/327/501/7).

LITERATURE CITED

- ARNOLD, E. N. 1984: Evolutionary aspects of tail shedding in lizards and their relatives. *J. nat. Hist.* 18: 127-169.
- _____. 1988. Caudal autotomy as a defence. *In: Biology of the Reptilia*. Vol. 16. pp. 235-273. C. Gans & R. B. Huey (Eds). Wiley, New York.
- _____. 1997. Interrelationships and evolution of the east Asian grass lizards, *Takydromus* (Squamata: Lacertidae). *Zool. J. Linnean Soc.* 119: 267-296.
- BISCHOFF, W. 1992. [Overview of the species and subspecies of the family Lacertidae. 6. The genera *Poromera*, *Psammodromus*, *Pseuderemias*, *Takydromus*, and *Tropidosauria*]. *Die Eidechse* 6: 13-17. [In German.]
- BOBROV, V. V. 1992. Notes on lizards (Reptilia, Sauria) from southern Vietnam. *J. Bengal nat. Hist. Soc. n.s.* 11(1): 17-24.
- _____. 1995. Checklist and bibliography of the lizards of Vietnam. *Smithsonian Herpetol. Inform. Serv.* 105: 1-28.
- BÖHME, W. 1978. [Kühnelt's principle of regional stenoecy and its bearing on the subspecies problem: a theoretical approach.]. *Z. Zool. Syst. Evolutionsf., Hamburg* 16(4): 256-266. [In German.]
- BOULENGER, G. A. 1921. Monograph of the Lacertidae. Vol. II. Adlard and Son and West Newman, Ltd., London. 451 pp.
- DAO, V. T. 1979. Ve dinh loai than lan Viet Nam. *Tap chi Sinh vat hoc* 1(1): 2-10. [In Vietnamese]
- DAREVSKY, I. S., V. S. NGUYEN & K. TRAN. 1986. [Materials on the herpetology of north Vietnam]. *Proc. Zool. Inst. USSR Acad. Sci.* 157: 62-68. [In Russian.]
- HAUSCHILD, A. 1986. [Comments on keeping and breeding of the grass lizard *Takydromus sexlineatus ocellatus* Cuvier, 1829]. *Herpetofauna* 8(44): 11-15. [In German.]
- NGUYEN, V. S. & T. C. Ho. 1996. Danh luc bo sat va ech nhai Viet Nam. Nha xuất ban khoa hoc va ky thuat, Hanoi. 264 pp. [In Vietnamese.]
- ROOIJ, N. DE 1915. The reptiles of the Indo-Australian archipelago. I. Lacertilia, Chelonia, Emydosauria. E. J. Brill, Leiden. 384 pp.
- SMITH, M. A. 1935. The fauna of British India, including Ceylon and Burma. Reptilia and Amphibia. Vol. II. Sauria. Taylor and Francis Ltd., London. xiii + 440 pp.
- TIKADER, B. K. & R. C. SHARMA. 1992. Handbook: Indian lizards. Zoological Survey of India, Calcutta. 250 pp.
- ZHAO, E.-M. & K. ADLER. 1993. Herpetology of China. Society for the Study of Amphibians and Reptiles, Contributions to Herpetology 10. Oxford, Ohio. 522 pp + 48 pl + 1 folding map.
- ZIEGLER, T. & W. BISCHOFF. In press. [*Takydromus (Platyplacopus) kuehnei vietnamensis* ssp. n., a new subspecies of grass lizard from Vietnam (Reptilia: Squamata: Lacertidae)]. *Salamandra* [In German.]
- _____, X. Q. HOANG & W. BÖHME. 1998. [Contribution to the knowledge of the grass lizards of Vietnam (Reptilia: Lacertidae: *Takydromus*)]. *Herpetofauna* 20(114): 24-34. [In German.]

Thomas Ziegler, Wolfgang Böhme and Wolfgang Bischoff, Zoologisches Forschungsinstitut und Museum Alexander Koenig, Adenauerallee 160, D-53113 Bonn, Germany. Emails (T. Ziegler): uzsmdb@uni-bonn.de; (W. Böhme): w.boehme.zfmk@uni-bonn.de

Received: 28 June, 1999.

Accepted: 25 July, 1999.