

A Key to the Blind Snakes in Thailand

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ABSTRACT.—To date, following 10 species of the blind snakes have been recorded from Thailand: *Ramphotyphlops albiceps*, *R. braminus*, *R. lineatus*, *R. ozakiae*, *Typhlops diardi*, *T. floweri*, *T. khoratensis*, *T. muelleri*, *T. porrectus* and *T. trangensis*. We provide a key to these species, which was constructed on the basis of external characters, such as the numbers and arrangements of scales. This key should be useful for biologists and researchers who are interested in the diversity of the blind snakes in Thailand.

KEY WORDS: Typhlopidae; blind snake; key; Thailand

INTRODUCTION

The blind snakes are small to moderate-sized primitive snakes that constitute three families, Anomalepididae, Leptotyphlopidae and Typhlopidae. In Thailand, only the family Typhlopidae is found (Taylor, 1965; Nabhitabhata, 1989; Cox, 1991). Their general characteristics include worm-like cylindrical body, smooth and polished body scales that lack discernible differentiations, eyes covered by ocular shields, and short tail with a terminal spine. Typhlopoid snakes have no venom, and thus are harmless to humans. They are commonly found under fertile soil, stones and rotten logs, and in termite mounds. After heavy rain, they are sometimes seen on the ground surface as well. Moreover, some species are also found on trees (Das and Wallach, 1998; Crombie and Pregill, 1999). The blind snakes occur throughout Thailand with *Ramphotyphlops braminus* being the most common species (Figure 1).

MATERIALS AND METHODS

Two hundred and forty-one specimens were examined for the construction of the key. Some of these specimens were obtained by field surveys during a period from January 1997 to February 2000, whereas others were loaned from museums in Thailand and abroad (see museum catalogue numbers and their locality data in Appendix). These specimens were identified to the following 10 species mostly using keys and descriptions provided by Taylor (1965) and Cox (1991): *Ramphotyphlops albiceps*, *R. braminus*, *R. lineatus*, *R. ozakiae*, *Typhlops diardi*, *T. floweri*, *T. khoratensis*, *T. muelleri*, *T. porrectus* and *T. trangensis*. Then, morphological characteristics of those specimens were examined more in detail to create a more comprehensive key as below. Use of body coloration in this key is avoided as long as possible, because it may gradually fade after being preserved in ethanol or formalin. Moreover, live individuals at different physiological stages were found to have more or less different colorations. For example, in most, if not all

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species, the body coloration becomes more whitish or grayish (see Figure 1) with eyes and head glands being more obscure prior to molting.

A stereo microscope and a vernier-caliper served as major tools for the examinations of external characters in specimens: the former aided observations of qualitative and meristic characters, such as the arrangement of head scales and the numbers of body scales, whereas the latter was useful in obtaining measurements, such as snout-vent length, tail length and body width, with high accuracy.

HOW TO USE THE KEY

Before using this key, it is recommended to look first at the overall scale condition of the specimen to be identified since it distinguishes the blind snakes from the other organisms with similar size and body shape. The blind snakes must have large homologous imbricate scales on whole surfaces of body and tail including venters, whereas in others body is covered with ring-like cutaneous grooves or has a series of distinctly enlarged ventral scales. A blind snake could then be identified down to species by starting from the first couplet of the key, and

following the same steps taken in conventional dichotomous keys.

When handling preserved specimens, some precautions should be taken in order to examine key characters with certainty. The scale count is, for example, to be done after its surface was dried out by wiping with a piece of tissue paper. Scales that were counted should be marked with a fine-point chemical pen. This practice will reduce the confusion it might have otherwise while counting. Positions of head scales and tail scales, and the arrangement of scales to be counted are shown in figure 2 and 3, respectively.

In the following key, the scale formula, A-B-C, refers to the numbers of scale rows at nape (A), midbody (B), and the portion just in front of cloaca (C). Legends of abbreviations used in the key and figures are as follows: BW, body width; IOD, interorbital distance; SVL, snout-vent length; TL, tail length; TW, tail width; f, frontal scale; ifl, infralabial scale; ins, infranasal suture; ip, interparietal scale; m, mental scale; ms, middorsal scale; n, nasal scale; no, nostril scale; o, ocular scale; p, parietal scale; pf, prefrontal scale; po, preocular scale; pto, postocular scale; r, rostral scale; sms, submiddorsal scale; sns, supranasal suture; so, subocular scale; sp, spine; spl, supralabial scale; spo, supraocular scale.



FIGURE 1. The common blind snakes (*Ramphotyphlops braminus*) in intermolting stage, CUB MZ R 2000.6 (a) and immediately prior to molting CUB MZ R 2000.87 (b).

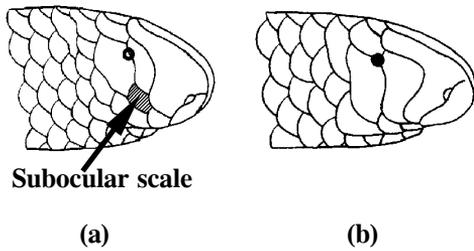


FIGURE 4. Head with the subocular scale, (a) and without subocular scale (b).

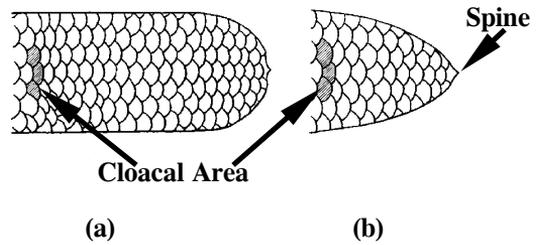


FIGURE 5. Ventral view of tails with blunt (a) and acute tips (b).

3. A	Scale formula 20-20-20	4
B	Not as above	7
4. A	Inferior nasal suture in contact with preocular (Figure 6a)	5
B	Inferior nasal suture in contact with 2 nd supralabial (Figure 6c)	6

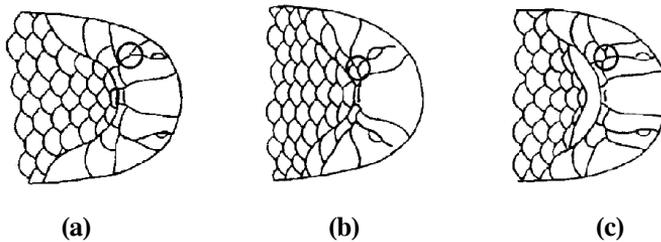


FIGURE 6. Ventral view of heads showing relative positions of inferior nasal suture (circled).

5. A	Glands evident along sutures of head scales (Figure 7a); pupils visible (Figure 8a); IOD/SVL 0.0052-0.0105	<i>R. braminus</i>
B	Glands along sutures of head scales absent (Figure 7b); pupils invisible (Figure 8b); IOD/SVL 0.0142	<i>T. khoratensis</i>

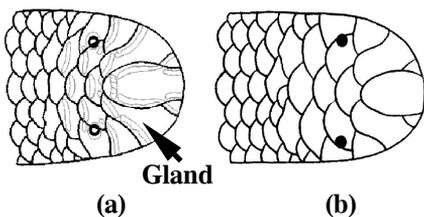


FIGURE 7. Dorsal view of heads of *R. braminus* (a) and *T. khoratensis* (b), showing the conditions of glands running along scale sutures.

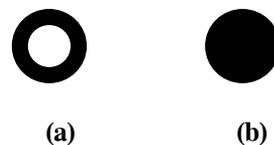


FIGURE 8. Conditions of pupils in *R. braminus* (a) and *T. khoratensis* (b).

6. A Head to nape, cloacal area and spine white (Figure 9a); rostral broad, about 47% of head width (Figure 10a); nasal completely divided, superior nasal suture touching rostral; tail short, TL/SVL 0.0189*R. albiceps*
 B Rostral and labials, and cloaca to spine white (Figure 9b); rostral narrow, about 38% of head width (Figure 10b); nasal division incomplete, superior nasal suture not touching rostral; tail long, TL/SVL 0.0296*R. ozakiae*

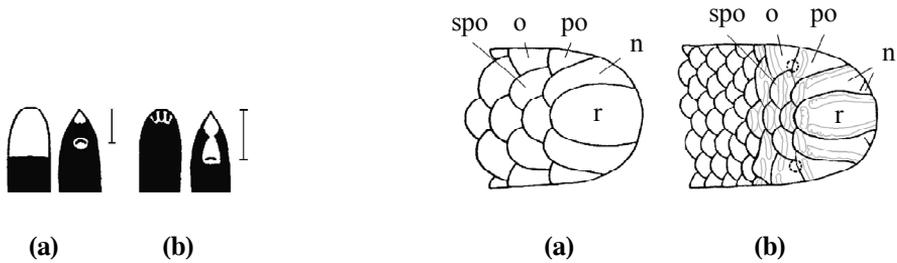


FIGURE 9. White areas on heads (dorsal view) and tails (ventral view) of *R. albiceps* (a) and *R. ozakiae* (b).
 FIGURE 10. Dorsal head scales of *R. albiceps* (a) and *R. ozakiae* (b).

7. A Scale formula 22-22-22; inferior nasal suture contacting 1st supralabial (Figure 6b); narrow stripes along upper body; rostral very broad, about 70% of head width; no preocular; eyes invisible (Figure 11)*R. lineatus*
 B Scale formula different from 22-22-228

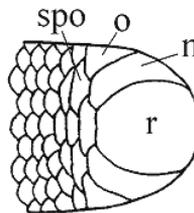


FIGURE 11. Dorsal head scales of *R. lineatus*.

8. A A depression, looking like a dark gray patch, present on posterior part of each dorsal head scale (Figure 12a); glands along sutures of head scales invisible; eyes dimly visible; scale formula 24-24-24; gray above and creamy white below; TW/SVL 0.0286*T. trangensis*
 B No depressions on head scales; glands evident along sutures of head scales (Figure 12b); eyes visible; scale formula 24-24-24 or different9

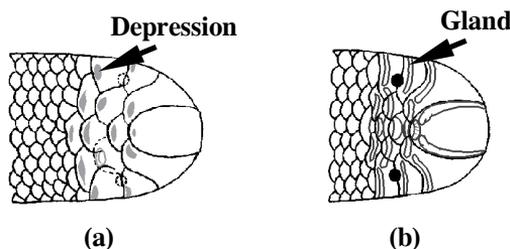


FIGURE 12. Dorsal head scales of *T. trangensis* (a) and *T. diardi* (b).

9. A Black in dorsum, creamy white in venter, their borders sharp distinct; TL/SVL 0.0101-0.0185; TL/SVL 0.0148-0.0275*T. muelleri*
 B Brown in dorsum, paler in venter, their borders indistinct; TL/SVL 0.0180-0.0272; TW/SVL 0.0298-0.0306*T. diardi*

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APPENDIX

Numbers of voucher specimens deposited in the Chulalongkorn University Museum of Zoology, and the Field Museum of Natural History (Chicago) were proceeded by CUB MZ R and FMNH, respectively.

Voucher specimens: *Ramphotyphlops albiceps*, CUB MZ R 1383, Na Pradoo, Pattani. *R. braminus*, CUB MZ R 003547, Bangsaen, Chon Buri; CUB MZ R 34977, Chulalongkorn University, Bangkok; CUB MZ R 34254, Udon Thani; CUB MZ R 34697, Rice Research Station, Phatthalung; CUB MZ R 033546, Saraburi; CUB MZ R 616, Hua Hin, Prachuap Khiri Khan; CUB MZ R 033174, Saraburi; CUB MZ R 033176, Saraburi; CUB MZ R 611, Saraburi; CUB MZ R 033329, Songkhla; CUB MZ R 271, Muak Lek, Saraburi; CUB MZ R 033175, Hua Hin, Prachuap Khiri Khan; CUB MZ R T.S.M. 60, Chulalongkorn University; CUB MZ R 34172, Bang Khen, Bangkok. *R. lineatus*, FMNH 178590, Na Pradoo, Pattani. *R. ozakiae*, FMNH 180007 (paratype), Pak Thong Chai, Nakhon Ratchasima. *Typhlops diardi*, CUB MZ R 2000.230, Na Pradoo, Pattani; FMNH 180008, Pak Thong Chai, Nakhon Ratchasima. *T. floweri*, CUB MZ R 2000.214, Rangsit, Bangkok. *T. khoratensis*, FMNH 178266 (paratype), Friendship Highway, Muak Lek, Saraburi. *T. muelleri*, FMNH 178374, Pattani; FMNH 180023, Pak Thong Chai, Nakhon Ratchasima. *T. porrectus*, CUB MZ R 2000.196, Rangsit, Bangkok; CUB MZ R 2000.213, Rangsit, Bangkok. *T. trangensis*, FMNH 178236 (holotype), Khao Chong Forest Experiment Station, Trang.

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