

## New Pupilloid Land Snails from Thailand (Pulmonata: Pupillidae)

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**ABSTRACT.**—Two new species of *Anauchen* from limestone areas, Sichang Island, Chon Buri Province and Khao Chong Pran, Ratchaburi Province are reported. *Anauchen sichang* n. sp. has four major apertural teeth with an angular notch located almost near apertural edge. The parietal, columellar lamellae, suprapalatal and upper palatal fold with small interpalatal fold located. *Anauchen khaochongpran* n. sp. has four small plicae i.e. parietal, upper and lower palatal and columellar notch.

**KEY WORDS:** *Anauchen sichang*; *Anauchen khaochongpran*; Pupillidae; Stylommatophora; Pulmonata; Thailand

### INTRODUCTION

The genus *Anauchen* Pilsbry, 1917 differs from related Southeast Asian pupilloid snails by having only one major tooth on the parietal wall of the shell aperture. Previously there were eight known species in the genus, one in southern China (Gredler, 1885), three in Vietnam (Mabille, 1887; Bavay and Dautzenberg, 1903) and four from Thailand (Panha, 1997; Burch and Panha, 2000). Two additional species from Thailand are now added to the genus.

*Anauchen sichang* n. sp.

**Description of holotype.**—Shell (Fig. 2) 2.6 mm high and 2.1 mm wide with 4½ whorls. (Shell measurements of a type series are given in Table 1). The last whorl is enlarged when compared to the preceding whorls running along with spiral sulcus. The umbilicus is open and deep. The periphery of the last whorl is rather

strongly shouldered. The peristome is complete, expanded, not adnate. The body whorl tilts up slightly near its proximal end, then, near the aperture, bends slightly downward. The apertural barriers are four, well-developed, set back in the aperture from the peristome. The parietal, columellar lamellae, supra palatal and upper-palatal folds with interpalatal fold located. There is an infrapalatal fold. All teeth are tuberculated. The tip of four major teeth pointed almost the same direction, the center of aperture.

**Type locality.**—Sichang Island, Si Racha, Chon Buri Province, 13°20'05"N 100°55'24"E, 70 meters elevation (CUMZ, Ver 44001), Thailand 2001 (leg. S. Panha). (See Fig. 1).

**Etymology.**—The specific epithet *sichang* is from the name of Sichang Island, the locality of the new species.

**Type material.**—The holotype (CUMZ, Ver 44001) is deposited in the Chulalongkorn University Zoological Museum together with 11 paratype specimens (CUMZ, Ver 44002). Another seven paratype specimens (CUMZ, Ver 44003) will be deposited in the University of Michigan Museum of Zoology (UMMZ), Ann Arbor.

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TABLE 1. Shell dimensions (in mm) of *Anauchen sichang* n.sp.

Types	Height	Width
Holotype	2.1	2.6
Paratype number		
1	2.1	2.6
2	2.1	2.6
3	2.1	2.6
4	2.1	2.6
5	2.1	2.6
6	2.1	2.6
7	2.0	2.6
8	2.0	2.6
9	2.0	2.6
10	2.0	2.6
11	1.9	2.5
12	1.9	2.5
13	1.9	2.5
14	1.9	2.5
15	1.9	2.5
16	1.9	2.5
17	1.9	2.5
18	1.9	2.5

Geographic distribution and habitat.—*Anauchen sichang* seems to be limited to eastern Thailand. Our specimens were found on limestone walls at the same habitat of *Cryptozonia siamensis* (Tomlin).

Diagnosis.—Shell with granular sculpture, embryonic shell sculpture is about one and half whorls. The shell characters look very similar to *Gyliotrachela khaochongensis* Panha, 1997 in general but the apertural dentition is totally different. There are four large distinct teeth with angular notch located almost near peristome.

*Anauchen khaochongpran* n. sp.

Description of holotype.—Shell (Fig. 3) 1.7 mm high and 1.2 mm wide with 4 whorls. (Shell measurements of a type series are given in Table 2). The last whorl is greatly enlarged when compared to the preceding whorls running along with spiral sulcus. The umbilicus is open and deep. The periphery of the last whorl is rather

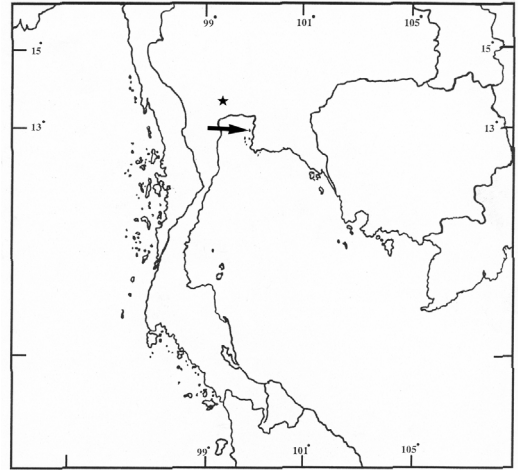


FIGURE 1. Map showing locations of the limestone mountain area of Sichang Island, Chon Buri Province (arrow); Khaochongpran area, Ratchaburi Province (star).

strongly shouldered. The peristome is complete, expanded, adnate. The apertural barriers are four small plicae, set back in the aperture from the peristome i.e. the parietal, upper and lower palatal and columellar notch.

Type locality.—Khaochongpran, Ratchaburi Province, 13°35'38"N 99°40'0"E, 60 meters elevation (CUMZ, Ver 44022), Thailand 1999 (leg. S. Panha). (See Fig. 1).

Etymology.—The specific epithet *khaochongpran* is from the name of Khaochongpran (Chongpran Mountain), the locality of the new species.

Type material.—The holotype (CUMZ, Ver 44022) is deposited in the Chulalongkorn University Zoological Museum together with 4 paratype specimens (CUMZ, Ver 44023). Another four paratype specimens (CUMZ, Ver 44024) will be deposited in the University of Michigan Museum of Zoology (UMMZ), Ann Arbor.

Geographic distribution and habitat.—*Anauchen khaochongpran* seems to be limited to western Thailand. Our specimens were found on limestone walls at the same habitat of *Hypselostoma khaowongensis* Panha, 1997.

Diagnosis.—Shell in general looks very similar to *Gyliotrachela khaochongensis* Panha, 1997 but the apertural dentition is totally different. The new species has very short apertural teeth

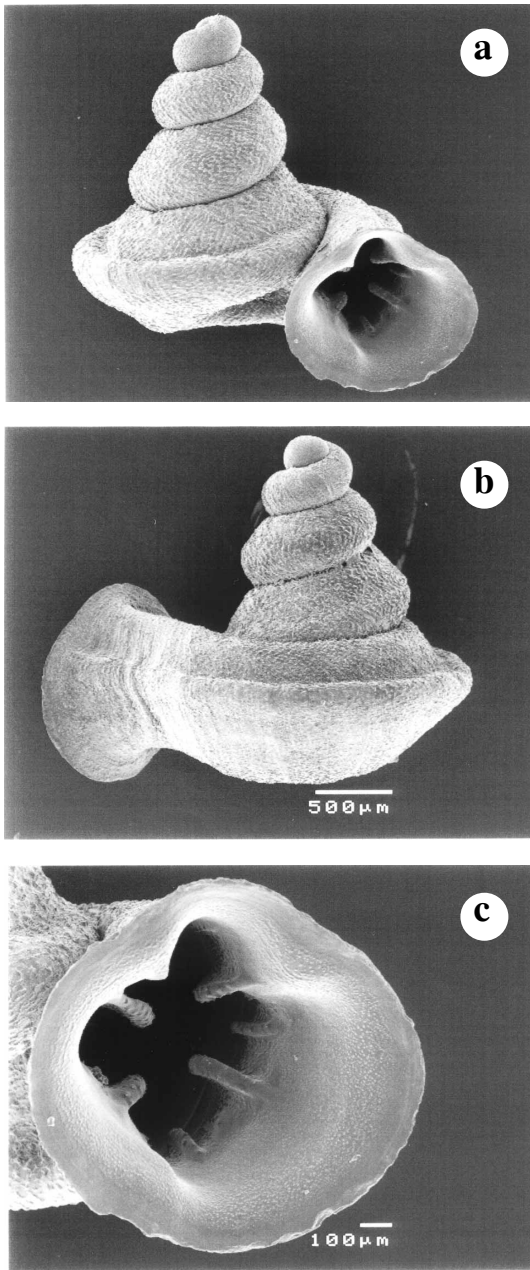


FIGURE 2. *Anauchen sichang*, holotype. a, apertural view; b, abapertural view; c, aperture enlarged.

which is absolutely different from other described *Anauchen* species

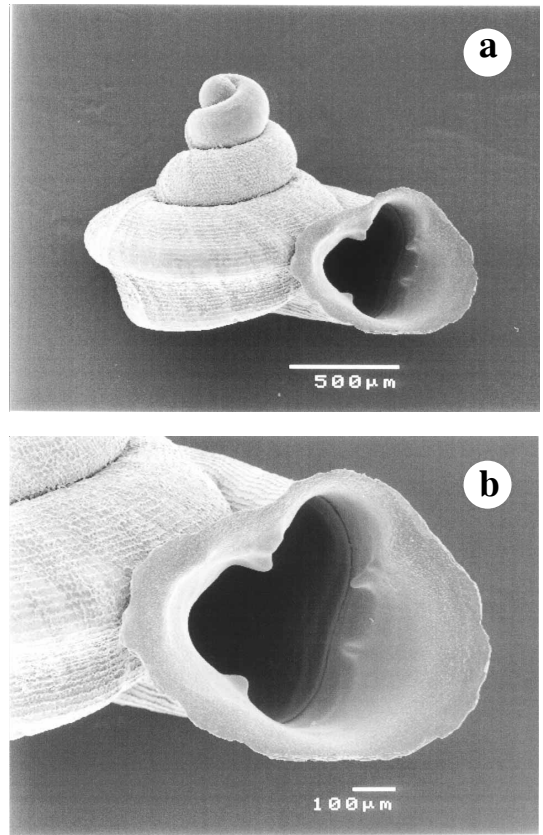


FIGURE 3. *Anauchen khaochongpran*, holotype. a, apertural view; b, aperture enlarged.

### DISCUSSION

The genus *Anauchen* was erected by Pilsbry in 1917 for species that did not fit into his diagnostic scheme for the other genera of Asian Pupillidae *s. lat.* That had well-developed apertural barriers (“teeth”), i.e., the genera *Boysidia*, *Gyliotrachela*, *Hypselostoma* and *Paraboyssidia*. Whereas the other genera have two lamellae on the parietal wall of the shell aperture (albeit concrescent in *Boysidia* and *Hypselostoma*), *Anauchen* has only one. In *Anauchen*, the angular lamella is absent. Pilsbry’s (*loc. cit.*, p. 188) description of *Anauchen* follows.

The shell is umbilicate, pyramidal, light-colored and spirally striate, the last whorl scarcely or not ascending and not free. The aperture is rounded, oblique, the peristome broadly expanded but thin, shortly adnate above. *No angular lamella*; parietal and columella lamellae developed, the latter horizontal; 0-3 plicae in the lip.

Type *Hypselostoma geretti* (Bavay & Dautzenberg).

This group is peculiar for having lost the angular lamella, leaving a simple parietal. Except in *H. messengeri*, the other teeth are more less completely degenerate. I do not know whether *A. rochebruni* and *angulina* are spirally striate or not. All but the last are from Tonkin.

This group is related to *Hypselostoma* by the spiral sculpture but differs by having no angular lamella, and the last whorl is adnate. This last is not a very important difference, and one which may perhaps disappear with future discoveries. I do not think it is closely related to *Boysidia*.

In Pilsbry's time there were only four known species for his new genus, three species in Vietnam and one in southern China. Pilsbry divided the four species into two groups, based on the shape of the last whorl—swollen but not angular for *Anauchen geretti* (Bavay and Dautzenberg, 1903) and *A. massageri* (Bavay and Dautzenberg, 1903), and “somewhat angular at periphery and umbilicus” for *A. angulinus* (Gredler, 1885) and *A. rochebruni* (Mabille, 1887). He separated the four species by their number of teeth, “five well-developed teeth” for *A. messengeri*, “three small teeth” for *A. geretti*, “two teeth” for *A. rochebruni*, and a parietal tooth only” for *A. angulinus*.

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TABLE 2. Shell dimensions (in mm) of *Anauchen khao-chongpran* n.sp.

Types	Height	Width
Holotype	1.2	1.7
Paratype number		
1	1.2	1.7
2	1.2	1.7
3	1.2	1.7
4	1.2	1.7
5	1.2	1.7
6	1.2	1.7
7	1.2	1.7
8	1.2	1.7

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