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Notes on Three Cave Trechines (Coleoptera, Trechinae) from the Western Part of Hubei, Central China

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Abstract Three cave-dwelling species of trechine beetles from the western part of Hubei are dealt with. They were originally described under two different genera, *Boreaphaenops* and *Superbotrechus,* but the former one of them is herewih divided into two independent genera in view of the striking difference in configuration adaptive to subterranean life. The new name given is *Yanzaphaenops,* and the type species is *Y. hirundinis* (S. UÉNO, 2005). Besides, two existing localities are recorded for *Superbotrechus bennetti* DEUVE et TIAN.

At the westernmost part of Hubei in Central China, a very deep gorge called Sanxia has been formed by the Yangtze River flowing from west to east, and the caverniferous limestone area is divided into two parts, the northern and the southern. Their subterranean faunas are considerably different from each other, and so far as concerned with trechine beetles, the southern part is mostly occupied by the members of *Cathaiaphaenops* (cf. DEUVE, 2000; UÉNO, 2000; DEUVE & TIAN, 2008; TIAN, 2008), while the caves in the northern part are sporadically inhabited by trechines belonging to a quite different lineage.

The species first made known from a cave lying at the northern side of the Yangtze River is *Boreaphaenops angustus* S. UÉNO (2002, p. 415, figs. 1–3) discovered in Lengre Dong Cave lying in Shennongjia Linqu. This is a medium-sized species of aphaenopsoid facies, whose true affinity has not been conclusively determined as yet. The second species was also found in a limestone cave lying in Shennongjia Linqu and was named *Boreaphaenops hirundinis* S. UÉNO (2005, p. 12, figs. 1–3). It is, however, so strikingly different in facies from *B. angustus* that its placement in *Boreaphaenops* is tentative and must be re-examined when more species could be discovered in Shennongjia or its neighbouring areas (cf. UÉNO, 2005, p. 12).

Since then, I have endeavoured to examine as many caves as possible, particularly on the western extension of Shennongjia, or the Daba Shan Mountains, but failed in finding out any troglobiontic trechines. On the other hand, an anophthalmic trechine beetle was recently discovered from a limestone cave located in Yichang Shi near the left bank of the Yangtze River, about 130 km distant to the southeast in a beeline from Lengre Dong Cave, the type locality of *Boreaphaenops angustus.* It was described by

DEUVE and TIAN (2009, p. 181, figs. 1–2) under the name *Superbotrechus bennetti,* and was carefully compared with *Boreaphaenops angustus,* though the authors concluded that the phylogenetical affinity of this new species was not certain at the present time.

Thus, taxonomical gap between *Boreaphaenops angustus* and *B. hirundinis* has not been bridged until now in spite of my painstaking efforts devoted in caves and of the discovery of a third species from the northern side of the Yangtze River. In view of this situation, I have decided to erect a new genus for *B. hirundinis,* which is much more highly adapted to the subterranean existence than *B. angustus.* On this occasion, I will also record two new localities of *Superbotrechus bennetti*, whose type cave was lost by road construction.

Before going into further details, I wish to express my deep appreciation to Mr. Hiroshi MIYAMA and Mr. FAN Ting for their kind help in field works.

Superbotrechus bennetti DEUVE et TIAN, 2009

(Fig. 1)

Superbotrechus bennetti DEUVE et TIAN, 2009, Bull. Soc. ent. Fr., **114**, p. 181, figs. 1–2; type locality: "grotte Duandongzi" at Huanghua.

Length: 5.50–5.60 mm (from apical margin of clypeus to apices of elytra).

This interesting species does not show any aphaenopsoid modification, bearing complete frontal furrows on head, relatively short antennae not reaching elytral apices, wide prothorax with anteriorly protrudent front angles and sharply denticulate hind angles, elongate elytra with square shoulders, relatively stout and not exceedingly long legs, and so on. Since a detailed description was given by the original authors, it does not seem necessary to repeat it except for some numerical data.

Standard ratios of body parts (the abbreviations used are the same as those explained in previous papers of mine): HL/HW 1.00, 1.00; HL/PL 0.91, 0.95; PW/HW 1.24, 1.25; PW/PL 1.13, 1.19; PW/PA 1.40, 1.47; PW/PB 1.36, 1.39; PB/PA 1.03, 1.06; EW/PW 1.60, 1.60; EL/PL 3.29, 3.24; EL/EW 1.82, 1.70.

Specimens examined. 1 ♂, Jinshi Dong, 480 m alt., Xingping Cun, Huanghua Xiang, Yichang Shi, Hubei, 25–VI–2010, S. UÉNO leg.; 1 ♂, Qingrenquan Dong, 180 m alt., Xinping Cun, Huanghua Xiang, Yichang Shi, Hubei, 24–VI–2010, H. MIYAMA leg. Both deposited in the collection of the Department of Zoology, National Museum of Nature and Science, Tokyo.

Notes. As was already mentioned, the small limestone cave in which the type specimens of *Superbotrechus bennetti* were collected, was destroyed by the construction of a new highway, and was forgotten even by local people. However, there are other caves opening on or under bluffs on both sides of the Duan'jiang He River. Most of them were not rich in the fauna, but we were able to find *Superbotrechus* in two commercialized caves. One of them, Qingrenquan Dong, is a draining cave not far from the lost type cave, and is developed along an underground stream flowing down through

Fig. 1. *Superbotrechus bennetti* DEUVE et TIAN, ♂, from Jinshi Dong Cave in Huanghua.
Fig. 2. *Boreaphaenops angustus* S. UÉNO, ♂, from Lengre Dong Cave in Shennongjia.
Fig. 3. *Yanzaphaenops hirundinis* (S. UÉNO), ♂, from Jin'yanxi Dong Cave in Shennongjia.

several cascades. The single known specimen of *Superbotrechus* was found among small gravel filling in a shallow trickle hole on the floor near the innermost of the tourists' passage. The other new locality, Jinshi Dong is located at the upper part of the ridge high above Qingrenquan Dong, though the two caves belong to the same village. There, our specimen of *Superbotrechus* was found quickly walking on a large flowstone about 1.5 m above the cave floor

Boreaphaenops angustus S. UÉNO, 2002

(Fig. 2)

Boreaphaenops angustus S. UÉNO, 2002, Elytra, Tokyo, **30**, p. 415, figs. 1–3; type locality: Lengre Dong Cave in Shennongjia Linqu.

This is a peculiar species, markedly differing in facies from most aphaenopsoid trechines known from China. Body narrow and elongate; head elongate and nearly parallel-sided, with wide neck; frontal furrows abruptly evanescent behind; posterior pair of supraorbital setae almost always duplicate; antennae long but fairly stout, not reaching elytral apices. Prothorax elongated barrel-shaped, about as long as head, with

sides finely bordered throughout and bearing two pair of marginal setae; both front and hind angles rounded. Elytra elongated subovate, with very obtuse humeral angles and very oblique prehumeral borders; dorsum only gently convex before the middle, superficially striate, both scutellar and apical strioles absent; stria 3 with three setiferous dorsal pores, none on other striae, preapical pore present; marginal umbilicate pores not aggregated except for the first three pores of the humeral set. Legs long and slender but not exceedingly long.

Range. Known so far only from Lengre Dong Cave in Muyu Zhen of Shennongjia Linqu in southwestern Hubei.

Genus *Yanzaphaenops* S. UÉNO, nov.

Type-species: *Boreaphaenops hirundinis* S. UÉNO, 2005.

As was described in detail in the original account, *Boreaphaenops hirundinis* shares many important character states with *B. angustus*. However, the former is different from the latter particularly in the following respects:— Head long, much longer than prothorax, and gradually narrowed posteriad towards neck, with two pair of supraorbital setae, the posterior pair of which are always simple and widely distant from the anterior pair; antennae very long and slender, exceeding elytral apices at least in ♂. Prothorax small, equally narrowed towards base and apex, with fine side-borders which are invisible in front; front angles rounded, hind angles subrectangular, postangular seta always absent. Elytra elongated ovate, much longer and wider than fore body; humeral angles evanescent, prehumeral borders very oblique and nearly straight; basal peduncle narrow, about a half as wide as prothorax; dorsum strongly convex, almost entirely striate, scutellar striole absent, apical striole obliterated; stria 3 usually with four setiferous dorsal pores; preapical pore present; marginal umbilicate pores as in *Boreaphaenops angustus*. Legs very long and slender, proportionally much longer than in *B. angustus*.

The differences given above seem to suffice for erecting a new genus for *Boreaphaenops hirundinis*. It will be called *Yanzaphaenops hirundinis* comb. nov.

Etymology. The new generic name, *Yanzaphaenops* is derived from "Yanzi" meaning a swallow in Chinese, and which has been used for the name of the type cave (Jin'yanxi Dong) and also for the name of the location of the cave (Yanzi Ya＝Swallow Pass).

Yanzaphaenops hirundinis (S. UÉNO, 2005)

(Fig. 3)

Boreaphaenops hirundinis S. UÉNO, 2005, J. speleol. Soc. Japan, **29**, p. 12, figs.1–3; type-locality: Jin'yanxi Dong Cave in Shennongjia Linqu.

Yanzaphaenops can be recognized at first sight because of its highly specialized

aphaenopsoid facies.

Range. Known so far only from Jin'yanxi Dong Cave at the Yanzi Ya Pass of Hongping Zhen in Shennongjia, southwestern Hubei.

要　　約

上野俊一: 中国湖北省西部に固有の洞窟性チビゴミムシ類 3 種について．—— 中国湖北省西部の石灰岩地域は，揚子江中流の三峡によって南北に二分されているが，洞窟性のチビゴミムシ相は，それぞれの地域で大きく異なり，峡谷の北側の地域には種類が少ない．ごく最近になって宜昌市の洞窟から *Superbotrechus bennetti* が発見されるまでに，この地域の洞窟から知られていたメクラチビゴミムシ類はわずかに 2 種で，いずれも神农架林区の洞窟にすみ，同属の別種だと考えられてきた．しかし，両者の外部形態には，地下生活に伴う形態的適応の程度にいちじるしい差異があって，これを埋めるような中間的な種も発見されないので，属を分割して 2 種の一方に新属を認めるのが，より適切な処置であろうと考えられるようになった．新たに提唱する属名は *Yanzaphaenops*，属基準種は *Boreaphaenops hirundinis* である．なお，*Superbotrechus bennetti* の基準産地は，高速道路の建設工事のために破壊されて現存しないが，近傍地域の洞窟を精査した結果，この種の生息する洞窟が新たに 2 カ所発見され，宜昌市黄花乡の地下に，分布域の広がりのあることが明らかになった．それで，黄花乡新坪村の金獅洞と情人泉洞との 2 洞を，この種の新産地として記録した．

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