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**The early records of fossil turtles from China**

[With 3 text-figs]

Najwcześniejsze znaleziska kopalnych żółwi z Chin

**Abstract.** In the present paper, the early records of fossil turtles known from China are presented, among which the material from the Lower Lufeng Series of Lufeng, Yunnan, south-west China, is the earliest, i. e. of a geological age corresponding to the Lias or Rhaetian. Successively, of the middle Jurassic, we have not only the genera *Chengyuchelys* from Sichuan and *Xinjiangchelys* from north Xijiang, but probably also the partly complete shell from Chenxi, Hunan, and the fragments from Baicheng, south Xinjiang and Xining, Qinghai, etc. These facts indicate that turtles had a wide geographical distribution in China even at early evolutionary stages. Furthermore, in the successive periods, i. e. from the late Jurassic to Quaternary, we have the most complete fossil record of turtles in series. It seems reasonable to suggest that China is indeed the important area in inquiring for the origin of turtles and in studying the early evolution of this animal group.

Since the Permian *Eunotosaurus* from South Africa was deleted from the turtles (Cox, 1969), the earliest record of this animal group, as far as it is known, is thus removed to the late Triassic *Proganochelys*. For a long time (nearly one hundred years), the turtle materials from this period were known only from Europe (West Germany), until the discovery from the late Triassic from Thailand in 1980—1981 which was determined by de BROIN (1984) as a new species of *Proganochelys*, *P. ruchae*. These are all data about the earliest turtles we have now.

Successively, from the early Jurassic, so far, no turtle has been reported, and even in the middle Jurassic, there were only a few doubtful genera known from Europe. Turtles got their flourish and bore a comparatively wide distribution practically from the beginning of the late Jurassic (ROMER, 1966; GAFFNEY, 1979).

However, in China, though no material of turtles has been found precisely from the late Triassic, one incomplete turtle shell was collected lately by our colleague from dark-red bed of the Lower Lufeng Series of Lufeng County,

Yunnan. The age of the bed is considered by some scientists as Rhaetian, while by others as Lias. The specimen, though has not yet been described, thus becomes the earliest turtle known from China so far.

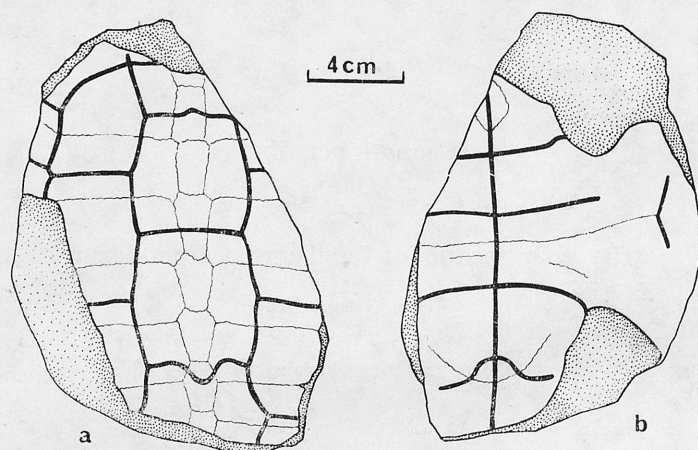


Fig. 1. *Chengyuchelys baenoides*, holotype (after YOUNG & CHOW, 1953)

Moreover, of the middle Jurassic, we have reported two genera and three species of turtles. They are *Chengyuchelys baenoides* and *C. zigongensis* from Sichuan, south-west China (YOUNG & CHOW, 1953; YEH, 1982), and *Xinjiangchelys junggarensis* from Xinjiang (= Sinkiang), north-west China (YEH, 1986). The exact locality and horizon of the type specimens of *C. baenoides* remain unknown. It consists of partly complete shells with mesoplastron, and was unearthed from a locality along Chengdu-Chongqing (abbreviated as Chengyu) railway under construction. YOUNG & CHOW (1953), who have established this genus and species, considered temporarily its age as late Jurassic according to the other turtle (plesiochelyids) and crocodile fossils found together with *Chengyuchelys*. YEH (1982) studied three turtle specimens from Zigong, Sichuan, among which two were partly complete, but the mesoplastron of them could have been observed, while the third one was much more damaged. Structurally, all these turtles more or less resembled *Chengyuchelys*, so, one of them was referred to *C. baenoides*, the other one was identified as a new species of the genus, i. e. *C. zigongensis*, and the third one, *Chengyuchelys* sp. As these turtles yielded together with various dinosaurs, the age of fossil-bearing bed was easy to be determined as the middle Jurassic. This fact enlightened the present author that the type specimens of *C. baenoides* from the locality along Chengyu railway might also be middle Jurassic in age. So far, all the turtles of this period known from China are limited only to Sichuan Province. Recently (YEH, 1986), a turtle from Junggar, north Xinjiang, named *Xinjiangchelys junggarensis*, was just described by the present author. The specimen was obtained associated with dinosaurs and tritylodont, and the age of the fossil-bearing

bed is most probably of the middle Jurassic. The known distribution of turtles of this period thus expanded largely from south-west China to north-west China. *X. junggarensis*, though resembles somewhat *Chengyuchelys*, still differs from the latter in some main characters.

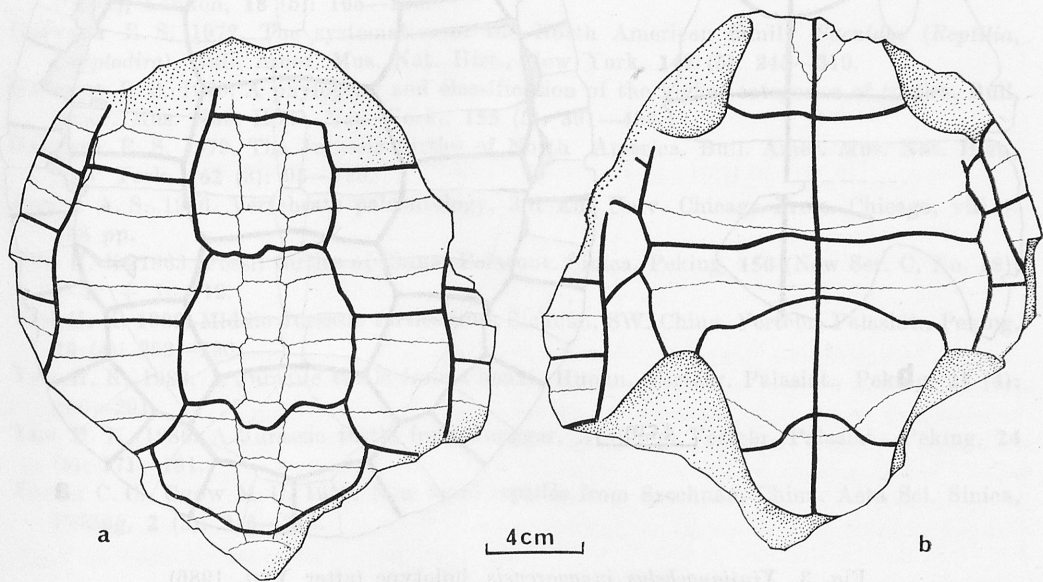


Fig. 2. *Chengyuchelys zigongensis*, holotype (after YEH, 1982)

As for the systematic position of the genera *Chengyuchelys* and *Xinjiangchelys*, unfortunately, it is still uncertain. Formerly, when *Chengyuchelys* was established by YOUNG & CHOW (1953), the genus was temporarily referred by them to *Baenidae*, but with a question mark. GAFFNEY (1972: 251) pointed out later that "the described material consists of shells that lack distinctive baenid features", and he arranged a stratigraphic distribution for baenids only from the Cretaceous to Eocene. In the classification of turtles proposed by GAFFNEY (1975), there are only two families of the Jurassic, i. e. *Glyptopsidae* and *Plesiochelyidae*, both represented mainly by late Jurassic members. It is why the familial arrangement of *Chengyuchelys* and also of *Xinjiangchelys* is not certain. It seems to the present author that these two middle Jurassic genera from China may form a new family representing an early branch in the turtle evolution. The idea may be confirmed by the examination of other specimens from Zigong, because a lot of these middle Jurassic turtles have not yet been studied.

In addition to the materials mentioned above, a turtle from Chenxi, Hunan (middle China), described by YEH (1983) is probably also of the middle Jurassic age. Besides, more information on the turtles from this period have been obtained recently by us from Baicheng, south Xinjiang, Xining, Qinghai, west China,

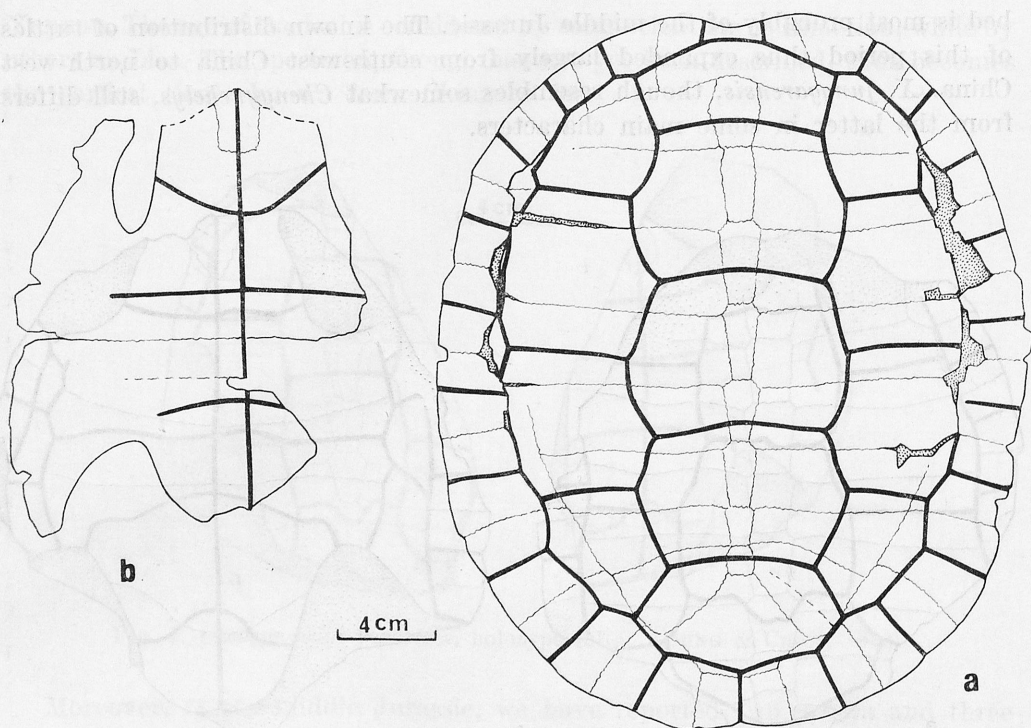


Fig. 3. *Xinjiangchelys junggarensis*, holotype (after YEH, 1986)

and from other places. All these finds show that turtles have got a wide geographical distribution in China even in the middle Jurassic.

From the late Jurassic, more turtles were reported from China, but there is no need to go into details here. Furthermore, in the Cretaceous and in every period of the Cenozoic, turtles have become the common fossils in China, and a lot of papers about them have been published (YEH, 1963). From the Upper Jurassic (Lias) to Quaternary, we have indeed a series of turtle records; China thus enjoys the longest historical record of turtles so far known in the world. If the upper Triassic turtle from Thailand is to be considered in together, Asia would become the unique area in having the most complete historical record of turtles. It is therefore reasonable to think that Asia, or even China, is indeed an important area in inquiring for the origin of turtles and in studying the early evolution of this animal group.

Finally, the present author would like to dedicate this short paper to Professor M. MEYNARSKI in honour of his retirement and his scientific successes, and in memory of our scientific friendship since 1950s.

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## STRESZCZENIE

W niniejszej pracy przedstawiono najwcześniejsze znaleziska kopalnych żółwi znanych z Chin. Najstarszy materiał pochodzi z liasu lub retyku (trias; dolny lufeng) stanowiska Lufeng w prowincji Jünnan, południowo-zachodnie Chiny. Ze środkowej jury pochodzą nie tylko znaleziska rodzajów *Chengyuchelys* z prowincji Syczuan i *Xinjiangchelys* z północnej części prowincji Sinciang, ale również częściowo kompletne pancerze żółwi z prowincji Szansi, Hunan, oraz fragmenty pancerzy z południowego Sinciang, Cinghai i in. Powyższe dane wskazują, że żółwie miały w Chinach szerokie rozszedlenie geograficzne nawet we wczesnych stadiach ewolucyjnych. Ponadto, z okresu od późnej jury po czwartorzęd, z Chin pochodzą serie kompletnych okazów kopalnych żółwi. Staje się więc oczywiste, że Chiny stanowią bardzo ważny obszar dla badań nad pochodzeniem żółwi oraz ewolucją tej grupy zwierząt.

Edited by Dr. Z. Szyndlar

