

Research Advances

Newly Discovered Jurassic and Cretaceous Strata in the Yidun Area, SW China and their Constraints on the Mesozoic Tectonic Evolution of the Eastern Tethys

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The Yushu-Yidun arc magmatic belt has attracted much attention among geologists due to its complete record of the evolutionary process of the Sanjiang tectonic belt in eastern Tethys and its favorable metallogenic conditions. This belt is composed of the Late Triassic volcanic-sedimentary rock series, and the Indosinian and Yanshanian granite intrusions. It has long been believed that there are no Jurassic or Cretaceous strata in this area.

Wang et al. (2002) first discovered and reported the Jurassic strata in the Muli County, Sichuan Province. Thereafter, Jurassic strata were discovered and continually reported in the Xinlong County, Shiqu County of Sichuan Province. However, the strata are only distributed in a narrow belt called the Garzi-Litang composite tectonic belt.

Recently, we have discovered and confirmed the Jurassic strata, previously considered as Triassic strata, in the Xiangcheng County, western Sichuan Province. These investigated Jurassic strata have the same formation time, sedimentary environments, lithological combination and biological assemblages as those discovered in the Garzi-Litang composite tectonic belt. Therefore, we defined the distribution of the Jurassic strata in the western Sichuan Province from the Garzi-Litang tectonic belt to the Yidun arc (Fig.1).

The Cretaceous stratum was first discovered in the Yidun area and the Bayankala stratigraphic region, which is a large part of eastern Tibet. Our stratigraphy and paleontology studies show that the Cretaceous stratum is a marine carbonate formation composed of huge and thick carbonate rocks, wherein we obtained many index fossils of the late period of the Early Cretaceous epoch including *Latusaera xigazeensis*, *Preveraeraea*, *Agathelia asperella*, and some conglomerates in places such as Shuiwa. Moreover, we established a stratotype section at Xiangcheng County and a formation-scale lithostratigraphic unit named Shuiwa Formation (K_1sh), a

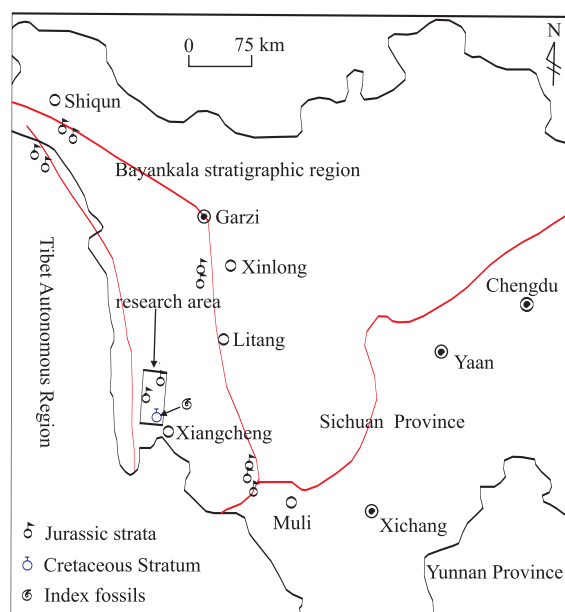


Fig. 1. Map showing distribution of the Jurassic and Cretaceous strata in eastern Tibet (modified from Wang et al., 2008).

biostratigraphic unit named *Preveraeraea isli-Latusaeraea xigazeensis* zone and a chronostratigraphic unit (K_1).

It has long been considered that the Lamaya Formation (T_3lm), a littoral neritic flysch formation with terrestrial fossils such as plants in the Yidun area, indicates that the continental blocks had combined together following the closing of the Garzi-Litang and Jinsha River oceans, and that a continental basin was consumed in the Yidun area during the Norian (Late Triassic). However, the Jurassic and Cretaceous strata implied that after the opening of the Bangonghu–Nujiang ocean basin to the west, the fault depression re-occurred in this region, which deposited the Jurassic strata composed of the lower clastic rocks and upper carbonate rocks, and formed a unified continental region.

The basin continued to spread and reached its maximum

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expansion period during the mid-Jurassic to the early-Cretaceous, whereas the ophiolite which occurred in the Bangonghu–Nujiang ophiolite mélangé belt suggests that the Neo-Tethys ocean basin had had an ocean crust to the west. With the sea water gradually deepening, the Shuiwa Formation (K_1sh) of marine carbonates with coria fossils was deposited in the Yidun area. It is revealed that the depositional environment of the Shuiwa Formation was a stable, normal, warm and clear carbonate platform, indicating that the basin had entered a stable development period.

The study of the stratigraphic correlation of the Jurassic and Cretaceous strata which formed in the evolutionary period of Neo-Tethys at Yidun, Sichuan Province and Bange, Biru, Luolong of Tibet autonomous region, indicates that the strata have similar lithological combination and biological assemblages, which suggests

that they all belong to the Eurasian passive continental margin. We also consider that the new marginal basin had been closing in a geological setting of convergence and had not grown to a mature stage because no deep-sea sediment was discovered. We conclude that the Genie granite in this area was formed in a post-orogenic, extensional tectonic setting at the Late Cretaceous (MABI et al., 2015), which indicates that the basin was probably closed before the Late Cretaceous.

References

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