

中国四川盆地の巨大古地震と三星堆・金沙文明の滅亡 Study on great palaeoearthquakes and the decline of the Sanxingdui and Jinsha civilizations, Sichuan basin, China

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チベット高原の東縁部に発達した内陸長大活断層である龍門山活断層帯により引き起こされた2008年 Mw7.9 四川大地震の関連研究により、過去数千年間にこの断層帯は繰り返し大地震を引き起こしていることが明らかにされた。

本講演では、四大文明の一つ、黄河文明と変わらぬ高度な文明であったと注目されている長江文明（三星堆文明及び金沙文明）の突然の消失は四川盆地西縁部の龍門山断層帯で繰り返し発生した巨大古地震による可能性が高いことを報告する。

The ruins of ancient civilizations damaged by large palaeoearthquakes, which have been reported worldwide, are often used as surface markers for Holocene tectonic and palaeoseismic events. Previous studies have demonstrated that recurring palaeoearthquakes have caused repeated soil liquefaction at the same site, leaving a record in both sediments and ancient ruins; such records can reveal a great deal about earthquakes that occurred prior to human-recorded observations or measurements^{5,10}.

The Sanxingdui civilization, which developed on the Sichuan Plain, central China, during the Bronze Age (ca. 4800 years ago), flourished from ca. 4200 to ca. 3500 years ago until its sudden disappearance ca. 3200 years ago. Subsequently, the Jinsha civilization arose in the area around Chengdu city, ca. 40 km southwest of the Sanxingdui site, but it too suddenly disappeared ca. 2500?2200 years ago. It has been speculated that floods or regime changes might explain the collapse of both civilizations, but no solid evidence for such causes has so far been reported.

In this study, to search for a link between palaeoearthquakes and the abrupt unexplained falls of the Sanxingdui and Jinsha civilizations, we investigated the liquefaction induced by great palaeoearthquakes that occurred repeatedly in the past 5000 years on the Sichuan Plain, central China, in the region of the former Sanxingdui and Jiasha civilizations. Here, we present evidence that great palaeoearthquakes may have caused the collapse of both the Sanxingdui and Jinsha civilizations, as the cultures flourished in the periods during ca. 4200?3500 years and ca. 2800?2300 years ago, respectively, on an active fault zone of the Longmen Shan Thrust Belt (LSTB) that triggered the 2008 Mw 7.9 Wenchuan earthquake. Field observations, archaeological evidence, and radiocarbon dating reveal that at least four great palaeoearthquakes have induced liquefaction in wide areas around the Sanxingdui and Jinsha civilization sites during the past 5000 years, with an average recurrence interval of ca. 1000 years. We suggest that palaeoearthquakes occurring ca. 3300 and ca. 2200 years ago caused the fall and disappearance of the Sanxingdui and Jinsha civilizations, respectively, by causing extensive damage to infrastructure and manufacturing facilities, as well as numerous deaths.

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