

The discussion of the relationship between the phototropism and the plate motion

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Plant phototropism means that trees on the side directly exposed to sunlight generally grow faster than on the opposite. The positive phototropism is easy to observe in crown and trunk. We choose the transverse section of the tree trunk to observe. The definitive intensity of plant phototropism ranges regularly from “strong to weak and finally disappeared” along with the latitudinal change from high to low. In the well-preserved in situ petrified wood phototropism phenomenon also exists (JIANG et al., 2014). Different plates have different tectonic movements. Some rotated during certain geological time, which recovered from the palaeomagnetic records. The eccentricity of tree growth rings should be related to the direction of sunshine. Then compare the phototropism direction of the trunk of the fossil wood with the living normal growth stumps, thus verify the paleomagnetic evidence whether the plates rotated or not (LIU, 2012).

The positive phototropism is received by measuring the eccentricity of the growth rings. The eccentricity is the direction from the pith to the longest part of the transverse section of the trees. We measured the eccentricity of the in situ preserved fossil trunks and the extant normal growth stumps in the same latitude without any disturbing elements. The difference of the two data of the eccentricity may reflect differences in latitude, which could deduce whether plate rotation occurs. The silicified wood in Xinchang of Zhejiang Province was preserved in Xinchang National Geopark of Silicified Wood. The in situ silicified stumps were preserved in the Guantou Formation of the Early Cretaceous. One well-preserved petrified stump showing distinct growth rings was chosen for measuring the positive phototropism direction, the result is SW225°. For comparison with the relevant data of living trees in the same area, without any other disturbing factors, exhibits a positive phototropism direction of SW219°±5°. Compared the phototropism of the silicified wood in Xinchang with the modern normal growth stumps in plain area, we found that both of them have eccentricity towards about 219°±5°, indicating that the South China Plate from the Early Cretaceous to nowadays did not rotate almost.

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LIU, B.P., 2012. 5th National Symposium on Structural Geology & Geodynamics, Abstracts, 26–27.