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The fossil plants from the Middle Triassic Linjia Formation in Benxi of eastern Liaoning, China and its paleoclimatic implication

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The Middle Triassic flora of eastern Liaoning is represented by fossil plants collected from the Linjia Formation of the Linjiawaizi in Benxi of eastern Liaoning, China. The Linjia flora is very spectacular because its components are complicated, representing the only one well-known fossil flora of the Middle Triassic age in NE China. Both first recorded typical elements in Paleozoic, such as *Lobatannularia*, *Taeniopteris*, *Pterophyllum*, *Psygmoiphyllum*, *Pecopteris lativenosa*, *P. orientalis* and *P. candolleana* as well as typical Mesozoic ones, such as *Neocalamites*, *Danaeopsis*, *Symopteris*, *Scytrophyllum*, *Thinnfeldia*, *Sagenopteris*, *Sinozamites*, *Yabeiella*, *Sphenobaiera*, *Podozamites* and *Albertia* are documented in this flora. Among them, *Lobatannularia*, *Taeniopteris* and *Scytrophyllum* are typical elements from the Northern Hemisphere. The flora also includes some interesting taxa, for example, *Benxiopteris*, which is similar to *Dicroidium* in the basic leaf structure, but different in reproductive organs; *Yabeiella* is a typical element from the Southern Hemisphere. The flora also includes some components which are difficult to be assigned, such as *Symopteris*, which is very similar to the Late Paleozoic element, *Fasciopsis*. In this flora, two specimens with their counterparts preserved, probably represent the *Gigantopteris*. In one of these two specimens, scars possibly representing the areas of ovule or seed attachment are also preserved. Cathaysian elements, e.g., *Lobatannularia*, *Taeniopteris*, *Gigantopteris?* and *Pecopteris lativenosa* mixed with typical Mesozoic components in this flora indicate that the distribution area of the Linjia flora probably represents the known final extinction area of the relict Cathaysian elements in the world. Because the distribution area of the flora was located in the northeastern North China Plate in Middle Triassic, which was controlled by the special warm and humid coast climate, it is reasonable for the relict Cathaysian elements to survive in that time.

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