

---

**Notes on a Palaeogene Species of *Metasequoia* in China\***

By

HSEN-HSU HU

*(Fan Memorial Institute of Biology)*

In 1941 S. Miki published in Japanese Journal of Botany Vol. XI, 261, a new genus *Metasequoia* based on the old species *Sequoia disticha* Heer and *Sequoia japonica* Endo. According to the author the genus *Metasequoia* is distinguished from *Sequoia* in the cone which has decussate arrangement of scales and delicate peduncle having scale leaves at the base. Its foliated shoots differ from *Sequoia* by distichous arrangement of leaves and by the brittle petiole. The type species, *Metasequoia disticha*, is distinguished from the second species, *M. japonica*, in having elliptic cones 15-20 mm. long and with 16-20 scales, while in the latter the cones are compressed, 12 mm. long and wide, and the scales about 12-16 in number. *M. disticha*, is abundant in the clay beds flora of Pliocene age in Central Hondo, Japan; while *M. japonica* is found only at Osusawa.

In 1928 S. Endo published in Japanese Journal of Geology and Geography Vol. VI, Nos. 1-2, p. 27, a paper called "A New Palaeogene Species of *Sequoia*", in which he described a new species, *S. chinensis*. This species is characterized by the distichous linear leaves decurrently attaching to the stalks with twisted base, and by the rather small cone about 22 mm. high and broad, with cordate base bearing a long stalk and about 10 scales. This species was collected by H. Yabe and Endo in Fushun coal mines, Manchuria and in Southern Saghalien.

---

\* Received for publication May 18, 1946.

As I scrutinize the plate of this new *Sequoia* published by Endo I found that it is more like *Metasequoia japonica* Miki than the true *Sequoia sempervirens*, in the long-stalked cone with 10 broad scales 15 mm. wide and 7 mm. high. The slender stalk is over 5 cm. long, which is not the case of true *Sequoia* but characteristic in the two species of *Metasequoia*. The scales are also decussate, which character shows better in fig. 4, pl. VII than in fig. 2, also in the figure of a longitudinal section of a cone of this species published in page 34, fig. 3, in "Supplement to the Cenozoic fossil plants" published by Endo in 1933 in Japanese. In this figure the 4 pairs of decussate cone scales and the long stalk are clearly presented. Thus a transfer of name is necessary as follows:

*Metasequoia chinensis*, comb. nov.

*Sequoia chinensis* Endo in Japan. Journ. Geol. and Geog. Vol. VI, p. 27, figs. 1-5.

*Distribution*: Fushun coal mines, Manchuria; Shimizusawa, Yubarigun province of Ishikari; Kawakami coal mines, Toyohara-gun, Japanese Saghalien.

As I shall discuss in another paper on a living species of *Metasequoia* which was recently discovered by Prof. Wan-chun Cheng in Wan Hsien, Szechuan, and is to be published jointly by Prof. Cheng and me, both the living and the fossil species of the genus *Metasequoia* are characterized by the distichous leaves twisted at base and by the long-stalked cone with decussate scales. The living species has deciduous leaves, which is also the case observed by Miki in fossil species. In this point *Metasequoia* is similar to *Glyptostrobus* which differs in the imbricate cone scales. The decussate cone scales surely suggest affinities to Cupressaceae, but the general aspects of this genus are those of *Glyptostrobus-Sequoia-Taxodium* complex that it is better to consider it a member of the family Taxodiaceae.

According to Endo the age of this species is Eocene. Apparently at that hoary age this genus *Metasequoia* is widely distributed from Japan, Saghalien, to Manchuria and eastern Szechuan, where a living species finds a haven of refuge in the warm sheltered valley in Central China, and remains to be the close relative and sole rival to the Sequoias in the western hemisphere.

REFERENCE

- Endo, S. : A new Palaeogene species of *Sequoia*. Jap. Journ. Geol. and Geog., vol. 6, p. 27-29, pl. 7. (1928)
- Endo, S. : Supplement to the Cenozoic fossil plants (in Japanese) (1933)
- Miki, S. : On the change of flora in Eastern Asia since Tertiary Period (I) : The clay or lignite beds flora in Japan with special reference to the *Pinus trifolia* beds in Central Hondo. Jap. Journ. Bot., vol. 11, p. 237-303, pl. 5. (1941).