17. A Neogene Species of Sassafras from Japan.

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Sassafras is one of the most ancient genera of dicotyledonous plants, its geological range extends back to the Lower Cretaceous. The well marked foliar characters, the outline and nervation, render the ready recognition of its remains in fossil state. The remains of its early forms are common in the Cretaceous rocks of Europe, North America and Arctic land. Their frequency has greatly reduced in the Tertiary period; the European and Greenland Eocene has a number of its species, but there are only one or two species in the contemporaneous deposits of North America. The later records are all from Europe except but one species, which is from North America. At present only two living species are known, one from the eastern North America and the other from China, and the present discovery of a new form of it in a Pliocene deposit of Japan is interesting as giving a probable link between the two forms now occupying two widely separate areas of distribution.

The North American species, Sassafras sassafras, is confined to dry or sandy soil in Massachusetts, Ontario, Michigan, Florida and Texas; it grows to a height of 30 m. in the southern warm temperate region, but is reduced almost to a shrub in the northern part of its distribution. The Chinese species, Sassafras tsumu, is reported from Sechuan, Hupeh and Chekian.

The present fossil material was collected by one of the writers (H. Okutsu) from a plant bed exposed in Osawa-mura, Miyagi-gun, Miyagi prefecture, some 12 km. northwest of Sendai. It is from a deposit correlated provisionally with the Lower Umoregi Beds of Sendai, Pliocene in age. The plant bed is rich in plant leaves; the most common forms are Betula maximovicziana Regel, Acer truncatum Bunge and Thujopsis dolabrata S. et Z.

Sassafras yabei n. sp.

Figs. 2-4.

Description: Leaves rather small, broadly ovate in outline, palmately three-lobed, margin entire, more or less decurrent below; lobes pointed, wedge shaped, lateral lobes smaller than the middle. Texture apparently membranaceous. Midrib stout, lateral primaries one on each side of midrib, subopposite, suprabasilar, diverging from midrib at angles of nearly 35 degrees and extending to tips of lateral lobes. Secondary veins thin, numerous, camptodrome. Petiole stout, about 2.5 cm. long.
Figure 1. A recent leaf of *Sassafras sassafras* (L.) Karst., for comparison. $\times \frac{1}{2}$ (Collected by S. Endô from the environs of Baltimore, Md., U.S.A.).

Figure 2. *Sassafras yabei* S. Endô and H. Okutsu. $\times \frac{1}{4}$ (Collected by H. Okutsu from a Pliocene plant bed near Sendai).

Figure 3. Diagramatic sketch of figure 2.

Figure 4. Diagramatic sketch of the counterpart of the specimen, figure 2.
Remarks: The fossil leaf is similar to certain European Pliocene forms, for example, *S. ferrettianum* Mass., and *S. variifolium* Nil.; as well as to the leaves of the living North American plant; the present one differs from the latter three by the relatively smaller size and broadly ovate outline. It is treated as a new species, rather simply on account of the novelty of its occurrence.

The specimen is stored in the Institute of the Geology and Palaeontology, Tôhoku Imperial University, Reg. No. 51776.

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