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An 802-year tree-ring chronology from Hatchobori 3-chome Site, Chuo-ku, Tokyo

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Dendrochronology is the science of dating tree rings, widely used to address environmental and historical issues. Despite the recent advance in chronology building, long tree-ring chronologies are still sparse in East Asia, including Japan. The purpose of the present study is to build a new long ring-width chronology of cypress species, from wooden remains recovered from an archaeological site in eastern Japan.

A large number of tub-shaped and box-shaped wooden coffins were excavated from Hatchobori 3-chome Site, Chuo-ku, Tokyo. The site dates the early half of the 17th century. The tub-shaped wooden coffins were mainly made of Chamaecyparis pisifera (Sawara cypress). According to wood identification, along with pollen and historical records, Suzuki and Noshiro (2004) deduced that the timbers were imported from the Kiso and Tenryu valleys.

71 boards from the tops, bottoms, or sides of the coffins were selected for tree-ring measurement. Of the 71 samples, 38 were visually and statistically crossdated based on standard procedures in dendrochronology. An 802-year raw ring-width chronology (from the 9th century to the 17th century) was successfully constructed. Mean t-value between the chronology and samples was 10.5, indicating high coherency among the tree-ring series.

The chronology was successfully crossdated with other chronologies from archaeological sites in Tokyo, indicating high t-values. For example, t = 13.8 with the chronology from the Mirokuji site, early Edo period, also consists of coffin boards mainly made of Sawara cypress. This result may indicate that timbers from those sites were imported from a certain limited area.

Further efforts should concentrate on obtaining fully continuous chronologies covering the last 2,000 years for tree-ring dating and climatic reconstruction.

Keywords: dendrochronology, chronology development, Sawara cypress, Edo period