

Origin of Urushi (*Toxicodendron vernicifluum*) in the Neolithic Jomon Period of Japan

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The lacquer tree, *Toxicodendron vernicifluum* (Anacardiaceae) is an endemic tree in East Asia and is called urushi in Japanese. The urushi lacquer is collected from the tree trunk of this species and has been utilized as an adhesive and/or a painting material from very ancient ages. Many kinds of lacquer ware have been recovered from Neolithic archeological sites in Japan and China, and the urushi lacquer ware especially characterizes the Jomon culture in Japan. To elucidate the origin of the Japanese urushi culture, we examined the distribution of urushi trees in East Asia, analyzed their chloroplast DNA, and re-examined the fossil record of the urushi plant.

Although the urushi plant is now distributed in China, Korea, and Japan, all of the trees in Korea and Japan are not native, but are cultivated. Thus the urushi trees in Japan is considered as an introduction from somewhere in China. We detected three haplotypes in the chloroplast DNA (trnL intron and trnL-F intergenic spacer regions) in of the urushi plant. The first one haplotype (haplotype V) is widely distributed in central China between Hwang Ho and Yangtze Jiang of China. The second haplotype (haplotype VI) is found in Japan, Korea, and Liaoning and Shandong provinces of China. The last one haplotype (haplotype VII) is found only in Shandong and Zhejiang provinces of China. The presence of wild urushi plant with the haplotype VI in certain areas of China may suggest the possibility that the urushi trees in Japan seem to have originated and introduced from those areas, if it was introduced. Fossil records of pollen, fruits, and wood of the urushi plant have been recovered from the early Jomon period in Japan, especially in eastern and northeastern Japan. One exception is the oldest record of the incipient Jomon period of ca. 12600 cal BP of a urushi fossil wood from the Torihama shell midden of Fukui prefecture. This fact is pressing us to re-consider whether what the urushi plant was brought over from China, or it is native to Japan originally.

Key words: chloroplast DNA, distribution, fossil, Torihama shell midden, *Toxicodendron vernicifluum*
