Natural Scientific Research on Gilt Remains
excavated from Kaburagi Tumulus No. 5

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The authors examined a pouch-shaped gilt receptacle and a gilt knife, excavated from the Kaburagi Tumulus No. 5 in Matsuo Town, Sanbu County, Chiba Prefecture. The results of analysis using a X-ray CT and a scanning electron microscope with a X-ray microanalyzer, showed that the copper surfaces of the two remains were chemically gilt with extremely thin gold (at maximum thickness of 10 μm) by an amalgam method. Silver was crystallized in the copper matrix. From the metallurgical examination of this crystallization of silver, it was found that this was because silver, unlike gold, has a low solubility in copper. Then, a reproduction test was planned to verify this. Analysis of copper test material with 0.2% to 4% of silver, showed that silver crystallized granularly in the copper matrix when it contained 1% or more of silver. In the third section (the end of the sword sheath) of the gilt knife, the iron blade remains until 100mm from the end of the sheath, and the blade is more rusted than inside the sheath.