Cannabis sativa fruits have been excavated from archaeological sites since the middle phase of the early Jomon period; however, it is necessary to examine the cultivation area of Cannabis sativa around archaeological sites on the basis of the evidences of both pollen and fruit because Cannabis sativa fruit may have been brought to the sites from other regions by the Jomon people. Humulus lupulus L.var. cordifolius and Humulus scandens close related to Cannabis sativa, which was distributed throughout Japan. However, the clear difference in pollen morphology in these species has not always been recognized. On the basis of the pollen structure, observed using an optical microscope, and the measurement of the size of each part of the pollen image, it was revealed that Cannabis sativa and Humulus pollen grains were distinguishable by the relationship between the ratio of the endopore length to the equatorial length and the ratio of the exine thickness of the annulus to the equatorial length. For the Cannabis sativa pollen grains, the ratio of the endopore length to the equatorial length was lesser than approximately 0.105, with a small endopore length relative to the equatorial length. The intermediate morphology of Cannabis sativa and Humulus scandens pollen grains could be distinguished because the tectum of most Humulus pollen grains stopped at the level of the endexine, whereas the tectum of most Cannabis sativa pollen grains slightly penetrated the level of the endexine. Furthermore, airborne pollen and surface pollen spectra were studied to clarify the dispersal of Cannabis sativa. The results revealed that most Cannabis sativa pollen grains fell less than 50m from the edge of a Cannabis sativa field. As for the small dispersion area of Cannabis sativa pollen, it was assumed that the dispersion source was low (2–3m) in height and the cultivation was carried out where the wind was not strong. The observation results of the dispersion process were thought to be applicable to the past.

Key words: airborne pollen, Cannabis sativa pollen, dispersal of Cannabis sativa pollen, pollen morphology, surface pollen spectra