Effect of soil components on adsorption of Pepper Mild Mottle Virus by Japanese soils

Effect of soil components on adsorption of *Pepper Mild Mottle Virus* by Japanese soils

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The *Pepper Mild Mottle Virus* (PMMoV) is a soil-borne virus that causes the mosaic disease to *Capsicum* ssp. This virus disease had been controlled by soil fumigation using methyl bromide, but the method was banned in 2005. Therefore, a new management and control technology that replaces methyl bromide is required. In the present study, the adsorption of PMMoV by soils that is considered to be one of the most important factors of the virus inactivation was examined.

Five Andosols (three soils with a high humus content and two soils with a low humus content), a gray low land soil, a yellow soil, and an allophanic mineral sample were used. Two hundred milligrams of soil and mineral samples were mixed with 2 mL of phosphate buffer containing 100μg of PMMoV. The suspensions were shaken for 2 h then they were stored overnight at 4˚C, and were centrifuged at 20,000×g for 20 min at 4˚C. The concentration of PMMoV in the supernatant was determined by double antibody sandwich enzyme linked immuno solvent assay (DAS-ELISA) method and calculated adsorption rate. To evaluate the charge characteristics of the soil and clay samples on the adsorption of PMMoV, the adsorption experiments were also performed at pHs 4 and 5.

Large amounts of PMMoV particles were adsorbed by the soil samples with a low humus content at the low pH. This was attributed to the increase in the positive charges of the soil samples. On the other hand, low virus adsorptions were observed at any pH levels in the soils with a high organic matter content. There were close negative correlations ($P < 0.05$) between the PMMoV adsorption by the soils and the humus content of the soil samples. There was no significant relationship between the rate and Si_o or Fe_d contents. The present study suggests that the inhibitory effect of humus against the PMMoV adsorption by soils is rather important in Japan because the country is extensively covered by soils with a high organic matter content.

Isolation of plant growth-inhibiting compounds from acidulocompost; a garbage compost processed under thermoacidophilic conditions

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The use of garbage composts for agricultural production is essential for a sustainable society in the viewpoint of environmental conservation and resources protection. We have tested the agricultural use of acidulocompost (AC); a unique garbage compost processed under thermoacidophilic conditions (Nishino et al., 2003). We clarified that the garbage AC was more effective for potato production than cattle manure compost and showed a function of weed growth suppression (Tatenai et al., 2006).

In order to identify a plant growth-inhibiting compounds derived from garbage AC, we examined the followings; 1) the extracting method to effectively recover the active compounds from AC, 2) the effects on plant growth of the law material (cedar-wood saw material with a starter microorganism) used for acidulocomposting process, and 3) isolation of the active compounds from AC. The plant growth inhibiting activity was evaluated from the germination and the hypocotyl and radicle elongations of lettuce (*Lactuca sativa* L.) after 48 hours' in-