

学 位 論 文 要 旨	
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題 目	Ecological management for tuber-borne potato common scab by regulating the bacterial communities on the seed tuber periderm (ジャガイモそうか病の種イモ共存細菌群集制御による生態学的防除技術に関する研究)
<p>Potato common scab is a serious disease caused by soil- and tuber-borne pathogenic <i>Streptomyces</i> species. The surface coating treatment of seed tubers is one of effective methods in controlling tuber-borne common scab. Microbicide chemicals are generally used for the seed treatment, while the post-distillation slurry of barley-shochu can also have the similar effect to reduce the population density of the plant pathogen infected seed tubers, resulting in the decrease of disease incidence in the daughter tubers as well as the microbicide treatment (Tomihama et al., Jpn J Soil Sci Plant Nutr, 89:31-36, 2018). The objective of this study was to ecologically elucidate the detailed mechanism of the post-distillation slurry treatment.</p> <p>The results showed that the bacterial community associated with periderm of seed tubers was composed of a taxonomically diversified bacteria, with the genus <i>Bacillus</i> spp. being the universal and predominant genus on the seed tubers throughout all examined potato genotype and cultivation fields. One of the predominant species belonging to <i>Bacillus</i> genus was <i>B. aryabhatai</i>, which showed antagonistic ability against pathogenic <i>Streptomyces scabiei</i> isolated from the periderm of seed tubers. The microbicide treatment drastically reduced the bacterial population and affected the community structures of phylogenetically broad bacteria. In particular, the abundant ratio of <i>Bacillus</i> spp. was decreased including <i>B. aryabhatai</i>. In contrast, the post-distillation slurry treatment mostly maintained the original bacterial community of seed tubers, and suppressed the growth of <i>Streptomyces</i> spp. selectively, while increased the ratio of <i>Bacillus</i> spp. In addition, the pathogenic <i>Streptomyces</i> spp. tended to be more sensitive to the organic acids; citric acid, succinic acid, lactic acid and malic acid, which were contained in the post-distillation slurry.</p> <p>Thus, obtained results suggested that the antagonistic <i>B. aryabhatai</i> and the organic acids assumed to contribute the suppressing tuber-borne common scab by the post-distillation slurry.</p>	