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Basic analysis of volatile organic compounds from actinomycetes

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In recent years, the food problem has become serious as the world population increases. Consequently, further productivity improvement is required in agriculture. The control of phytopathogens which adversely affect crops is indispensable for stable crop production. Currently, chemical pesticides are the mainstream as a means to do so, but also microbial pesticides having various effects are attracting attention. As a candidate of microbial pesticide, our laboratory has isolated actinomycetes with antimicrobial activity against multiple phytopathogens. These actinomycetes produce gaseous antimicrobial substances. In order to gain insights on volatile organic compounds (VOCs) derived from actinomycetes, we focused on actinomycetes AR3, AR4 and AR10 strains which were found to be effective in the infection control experiments. First, the effects of VOCs derived from actinomycetes on growth of phytopathogens were investigated. Actinomycetes spore suspension was applied to the surface of the PDA medium and cultured for three days. After that, the petri plate with agar pieces of phytopathogen was inverted on top of the plate with actinomycetes and both plates were sealed and cultured for several days. As a result, the growth of phytopathogens was suppressed. In addition, VOCs derived from actinomycetes were subjected to GC-MS analysis. An adsorbent was placed inside a petri dish coated with actinomycetes and incubated for three days to adsorb VOCs. The adsorbent was extracted and subjected to GC-MS analysis. As a result, very similar peaks were detected in AR3 and AR4 strains. We are currently trying to identify VOCs, including analysis of AR10 strain.

Biography

Minori Maeda is pursuing her graduation in Bio-control Agents from the Environmental Biotechnology Laboratory of Kindai University in Wakayama.

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