

Control of Plant Pathogen by Salt Stress

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Summary

Ralstonia solanacearum is a pathogenic bacteria causing significant damage to solanaceous plants such as tomato. It is difficult to cultivate solanaceous plants in the farm field contaminated with this bacterium. Hydroponics, also known as soilless culture, is an option to avoid the pest. But the invasion of *R. solanacearum* to hydroponic solution occurs infrequently and might take a devastating damage on the yield of crops. Sterilization of hydroponic devices by hypochlorous acid is often conducted in order to solve this problem. However, with more people concerned about the environment, there is a growing need for reduction of the effects on the environment.

In “Zoku monomagire”, an antiquarian book in Edo period, the effect of salt water or sea water on *R. solanacearum* is described. Furthermore, recent studies reported that *R. solanacearum* should suffer from high concentration of salt. In this study, we develop the disinfect technique by using salt based on the knowledge about low salt resistance of *R. solanacearum*.

Ralstonia solanacearum, causing bacterial wilt disease, just after culturing in medium could not be detected in 35 g/L saline solution from 2 days after addition. After keeping *R. solanacearum* in sterile water for more than 1 month at 25°C, the pathogen survived in 35 g/L saline solution for more than 10 days. For killing the salt-tolerant pathogen, it is necessary to bring it into higher concentrate saline solution. The addition of sugar (glucose or sucrose) into 35 g/L saline solution killed the salt-tolerant pathogen within 4 days. Furthermore, the addition of acids (citric acid or acetic acid), alkali (sodium bicarbonate or sodium carbonate) or surfactant (sodium dodecyl sulfate) into 35 g/L saline solution resulted in killing the salt-tolerant pathogen within 1 day. Especially, addition of 20 mg/L sodium carbonate into saline solution was sufficient to kill the salt-tolerant pathogen within 1 day.