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Antimicrobial Activity of Chrysoeriol and Cochlioquinone-9 Extracted from Rice Inoculated with Whitebacked Planthopper

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[Introduction]

As environmental damage caused by chemical pesticides appears worldwide, eco-friendly agriculture is increasing, and finding eco-friendly pesticide materials has become very important. Chrysoeriol and cochlioquinone, one of the flavonoids, act as antibacterial and antioxidant, and increase the resistance of rice to whitebacked planthopper (WBPH). In this research, we extracted of chrysoeriol and cochlioquinone-9 (cq-9) from rice (*Oryza sativa* L.), and investigated the antimicrobial activity against rice pathogens to judge the possibility of use as an environmentally friendly biopesticide.

[Materials and Methods]

Cheongcheong, Nagdong and TN1 were used for plant materials. In the antimicrobial activity test, 2 bacteria and 11 fungi that causing rice disease were used. 2~3 leaves time of rice were inoculated with 2~3 instar WBPH for 1 week and leaves were cut. And then chrysoeriol and cq-9 were extracted with MeOH and separated from silica gel $60F_{254}$ plates. After confirming the material by LC/MS, it was applied to the medium (bacteria; LB, fungi; PDA). The growth was measured at 1 and 2 weeks after bacteria and fungi were inoculated. All experiments were replicated at least three times, and statistical analysis was performed using the SPSS program. Bacterial 16S and fungal ITS sequences were used for construction of the phylogenetic tree in the MEGA X program.

[Results and Discussion]

Antimicrobial activity test showed that chrysoeriol had antifungal activity against *Fusarium graminearum, Pythium graminicola*, and cq-9 had antifungal activity against *Cladosporium herbarum, Cladosporium cladosporioides, Gibberella zeae, Fusarium graminearum* and *Pythium graminicola*. cq-9 has an inhibitory effect against a wider range of fungi, but the inhibitory effect was higher in chrysoeriol. As a result, they were effective in limiting the growth of pathogens of the genus *Fusarium* sp., *Cladosporium* sp. and *Pythium* sp. This shows that they had great potential as plant materials as an alternative to chemical pesticides, and is also thought to be helpful in development for eco-friendly agriculture.

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