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Chemical study on antifungal substances produced by endophytic fungi

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The *Epichloë* endophyte is a microorganism that resides in the internal tissues of the temperate grasses of the subfamily *Pooideae* and provides the host plants with fastness against insect and pest damages. One of such endophyte *Epichloë festucae* 437 (vibA gene-overexpressed strain) was found to secrete potent antifungal substance against the important plant pathogen *Drechslera erythrospila* in a co-culture experiment. The main aim of this study was to isolate the active components produced by the endophyte and to determine their structures and mode of action. *E. festucae* 437 was cultured in PDB medium for seven days at 23°C. The active culture filtrate was freeze-dried and the residue was washed with methanol. An active methanol-insoluble powder was separated by ODS HPLC to give a partially purified substance that inhibited the spore germination of *D. erythrospila*. The major part of the structure was obtained by 2D NMR analysis. To complete the purification of the active substance and determine the molecular formula by MS, we have examined the HPLC conditions using a number of HPLC columns, which are appropriate for polar compounds. A relatively pure material was obtained, and ESI-MS was analyzed, providing two possible isomers with the molecular formula of $C_6H_{12}N_2O_2$. Since, these are not commercially available; we are synthesizing them to confirm the structure. The antifungal substance from the endophyte is possibly a chemical defense for the host plant and could be used for prevention from crop diseases. We are also analyzing the antifungal compounds in several types of strains from the genus *Neotyphodium* that is closely related to the *E. festucae* endophyte and their hybrid strains.

Biography

Enkhee Purev is a PhD candidate at the Nagoya University in Japan. She has experience in antifungal natural compound isolation, cancer cell modelling, drug discovery, actinomycete isolation and its taxonomy and biological activity techniques.

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