3. **Fungal Secondary Metabolites as Sources of Agrochemicals.** Jin-Cheol Kim, Gyung Ja Choi, and Heung Tae Kim. Screening Division, Korea Research Institute of Chemical Technology, Taejon 305-600, Korea

Fungi are remarkable in their ability to produce a vast number of diverse metabolites ranging in chemical complexity and biological activities. Many antibiotics from Actinomycetes have been commercialized as pesticides produced by fermentation, but none of fungal metabolites has so far been. Natural products including fungal metabolites have historically served as templates for the development of several important classes of agrochemicals. Leads for chemical synthesis are undoubtedly the preferred route for companies with a synthesis base and key examples. The initial reports of the fungicidal activity of the strobilurins and oudemansins, fungal metabolites of the Basidiomycete fungi *Strobilurus tenacellus* and *Oudemansiella mucida*, respectively, have led to a very large amount of interest. They have an action mode of the inhibition of mitochondrial respiration in fungi; oxidation of ubiquinol is blocked at the Q_o-site of the cytochrome bc1 complex, which is located in the inner mitochondrial membrane of fungi. These natural products stimulated major independent programs of synthetic chemistry by various companies including Zeneca, BASF, Shionogi, and Novartis. Several fungicides such as azoxystrobin, kresoxim-methyl, metominostrobin, and trifloxystrobin have been developed by using the fungal metabolites as lead molecules and commercialized.

In our research team, various *in vivo* assay methods including antifungal assays against 6 plant pathogens, insecticidal assays against 5 insects, and herbicidal assays against 10 upland and 7 paddy field weeds have been established. During our screening bioactive fungal metabolites from a number of fungi obtained from various origins by using the assays, we isolated and characterized 6 ophiobolins, 2 pyrenocines, one antifungal compound called as T-3 compound, and one novel phytotoxic metabolite, given trivial name BG compound. Ophiobolins from unidentified isolate of *Heminthosporium* species showed antifungal and phytotoxic activites. Especially, ophiobolin B exhibited potent disease controlling activities against rice blast, tomato late blight, and wheat leaf rust. Pyrenocines A and B were isolated from *Curvularia inaequalis*, a fungal pathogen of zoysiagrass. Pyrenocine A showed antifungal and phytotoxic activities, and pyrenocine B exhibited much weaker or no biological activity. T-3 compound was purified from the culture extract of *Nigrospora sphaerica*, a fungal pathogen of zoysiagrass. It also caused toxic effects to both fungi and plants. Among various fungi, the compound showed a potent and specific antifungal activity against *Phytophthora infestans* with a MIC value of 2.5 ㎍/ml. The chemical structure of novel BG compound produced by *Fusarium oxysporum* was determined as 1-(2-hydroxyvinylamino)-hexa-1,5-dien-2-ol. It showed a potent inhibitory effect on the growth of duckweed.