Title Ethylene inhibited aflatoxin biosynthesis is due to oxidative stress alleviation and related to glutathione redox state changes in *Aspergillus flavus*

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Abstract

The effect of 2-chloroethyl phosphoric acid (CEPA) on aflatoxin biosynthesis, the expression of aflatoxin biosynthetic genes, reactive oxygen species (ROS) formation, cellular redox status, and enzymes involved in glutathione consumption and regeneration in *Aspergillus flavus* was investigated. The results demonstrated that CEPA dose dependently inhibited aflatoxin B_1 production. The expression of two typical genes involved in aflatoxin biosynthesis, *aflR* and *aflD*, was reduced after CEPA treatment at 7 d. Meanwhile, CEPA significantly reduced ROS production and thiobarbituric acid reactive substances (TBARS), increased the ratio of reduced glutathione (GSH) and oxidized glutathione (GSSG) at 5, 6 and 7 d. The activities of glutathione peroxidase (GPx), glutathione reductase (GR), as well as glucose-6-phosphate dehydrogenase (G6PDH) were significantly inhibited after CEPA treatment at 5, 6 and 7 d. The present study suggested that ethylene reduced aflatoxin production is due to oxidative stress alleviation of fungal cells and is related to glutathione redox state changes.