

Detoxication of acetochlor phytotoxicity for rice induced by 5-methoxypsoralen

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Summary *Rhizoma et Radix Notopterygii*, derived from the dried rhizome/roots of *Notopterygium incisum* Ting. ex H.T.Chang or *N. forbesii* Boiss, is often used as a traditional medicine in China. However, there were few papers reporting its extensional use in agricultural production. In this study, we found that its extract 5-methoxypsoralen (5-MOP) can effectively reduce phytotoxicity of acetochlor (A) on rice-seedling, in a growth chamber test. We observed that the shoot height, root length, and fresh biomass of A-treated rice seedlings were about 37, 25, 35 percent lower than that of water-treated rice seedlings (control), respectively. However, these physiological indexes could be recovered to 91.7%, 92.5%, and 92.2% in the 5-MOP + A treatments, comparing with

control groups, respectively. The emergence rate can be enhanced to about 81% in the 5-MOP + A treatment, comparing with 63% in the A treatment. And this 5-MOP + A mixture treatment can also elevate the root activity to higher than 79.0% of the value for the non-treated control. Furthermore, we observed that the glutathione S-transferase (GST) activity has a significant improvement in rice seedlings during the detoxification process of acetochlor induced by 5-methoxypsoralen, which could play a leading role for detoxification of acetochlor. Our findings suggest that 5-MOP have the potential to be applied as safener for rice.

Keywords 5-methoxypsoralen, rice, safener, acetochlor, herbicide phytotoxicity.

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