

Secondary Metabolites from Nonhost Plants Affect the Motility and Viability of Phytopathogenic *Aphanomyces cochlioides* Zoospores

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The motile zoospores of the damping-off pathogen *Aphanomyces cochlioides* aggregate on host plants (*e.g.*, sugar beet, spinach) guided by the host-specific plant signal cochliophilin A before infection. To assess the potential role of secondary metabolites in nonhost resistance, acetone extracts of 200 nonhost traditional medicinal plants from Chinese and Bangladeshi origins were tested for the motility behaviour of *A. cochlioides* zoospores using a particle bioassay method. Nearly one third of the tested plant extracts exhibited diverse deleterious activities such as repellent, stimulant, motility halting and lysis against *A. cochlioides* zoospores. Among these active plants, an extract of the Chinese medicinal plant *Dalbergia odorifera* displayed potent repellent activity toward zoospores. Chromatographic separation of *D. odorifera* constituents revealed that the repellent activity was regulated by the cumulative effect of three motility-affecting isoflavonoids, *viz.* (\pm)-medicarpin (repellent at 150 $\mu\text{g/ml}$), (–)-claussequinone (stimulant at 100 $\mu\text{g/ml}$) and formononetin (stimulant and attractant at 50 $\mu\text{g/ml}$). A mixture (1:1:1, w/w/w) of these three compounds exhibited only repellent activity toward zoospores at a concentration lower than 50 $\mu\text{g/ml}$. These results suggest that nonhost plants might possess potential bioactive secondary metabolites to ward off zoosporic phytopathogens.

Key words: Chemotaxis of Zoospores, Repellent, Isoflavonoids