Direct testing of *Zingiber cassumunar* and curcuma comosa crude extracts on spore germination of *Colletotrichum* spp. enabled by a solubilizer, hydrogenated castor oil

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Abstract

Herb extracts are considered to be an alternative plant disease control approach instead of using chemical fungicides. However, their water insoluble characteristic generally is a problem in direct testing of the hostile effects of plant crude extracts on fungal spore germination in vitro. In our experiment, a high concentration of 40,000 or 50,000 ppm stock solution of herb crude extracts dissolved in 20% (w/w) hydrogenated castor oil enabled the further preparation of the tested concentrations by dilution. The solubilizer was not only safe, but also enhanced normal spore germination. Enabled by hydrogenated castor oil, detection of the hostile effects of ethanol or hexane extracts obtained from *Zingiber cassumunar* and *Curcuma comosa* on *Colletotrichum capsici* and *C. gloeosporioides* was accomplished. Spore germination of both species (13 isolates) was clearly inhibited by 25,000 ppm *Z. cassumunar* ethanol crude extract. The hostile effect was significant, resulting in dendroid or swollen germ tubes on both *Colletotrichum* species isolated from chilli anthracnose, and extreme suppression of germination of *C. gloeosporioides* isolated from mango fruit anthracnose. For *C. comosa*, the hostile effect was indicated by germination with failure of appressorium formation. Spore germination of *C. capsici* (5 isolates) was strongly inhibited by ethanol crude extract at 5,000 and 10,000 ppm, and by hexane crude extract at 10,000 ppm.