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EFFECT OF *Zataria multiflora* AND *Satureja hortensis* ESSENTIAL OILS, THYMOL AND CARVACROL ON GROWTH OF *Fusarium graminearum* ISOLATES AND DEOXYNIVALENOL PRODUCTION*

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Abstract

The effects of *Zataria multiflora* and *Satureja hortensis* essential oils, and thymol and carvacrol which are two main components of these essential oils were assayed on growth of 10 *Fusarium graminearum* isolates and reduction of deoxynivalenol production in PDA and PDB media. The results of this study showed that the essential oils and their main components had inhibitory activities against the isolates of this fungus and decreased deoxynivalenol production of *Fusarium graminearum* isolates. The minimum concentration of *Zataria multiflora* and *Satureja hortensis* and thymol and carvacrol for complete growth of *Fusarium graminearum* isolates in PDA media were 16, 31.5, 70 .and 15 µl/100ml respectively. The minimum concentration of *Zataria multiflora* and *Satureja hortensis* and thymol and carvacrol for complete growth inhibition of *Fusarium graminearum* isolates in PDB media were 16, 30, 70 and 20 µl/100ml, respectively. The lowest and highest dry weight of mycelia were obtained from No. 6 and No. 50 isolates respectively. *Zataria multiflora* and *Satureja hortensis* essential oils, and thymol and carvacrol decreased deoxynivalenol production of *Fusarium graminearum* isolated 84, 89.1, 95 and 86.6 % compared with the control treatment without any essential oil and effective compounds. Also in each milligram of dried mycelia in control, thymol, carvacrol, *Zataria multiflora* and *Satureja hortensis* essential oil's treatments 353.9, 17.9, 27.5, 92.6 and 94.2 ng g^{-1} deoxynivalenol was respectively detected. These results showed the direct effect of essential oils and their effective compounds on deoxynivalenol structure. Further more these compounds reduced deoxynivalenol production indirectly regards to their inhibition effects on the growth of *Fusarium graminearum* isolates.

Keywords: Essential oils, *Zataria multiflora*, *Satureja hortensis*, Thymol, Carvacrol inhibitory effects, *Fusarium graminearum*, Deoxynivalenol.

See persian text for figures and tables (Pages ۳۷-۵۰).

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