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## Lethal efficacy of seven plant essential oils against confused flour beetle adults, *Tribolium Cofusum* Jacquelin du val

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Disinfestation of stored-products after phase out of methyl bromide and dichlorvos has got difficult. Plant secondary metabolites with high vapor pressure are preferable choices for replacement of outdated applications. One of the most important and wide-spread stored-product pests is confused flour beetle, *Tribolium confusum* Jacquelin du Val (Coleoptera: Tenebrionidae). *T. confusum* doesn't only infest grain flour, but it has more than 20 hosts. The present study reports the use of plant-based fumigants as alternatives for managing this pest. The fumigant and insecticidal activities of *Cuminum cyminum* seeds, *Elettaria cardamomum* fruits, *Heracleum persicum* fruits, *Mentha longifolia* subsp. *noeana* aerial parts, *Rosmarinus officinalis* foliages, *Syzygium aromaticum* dried flower buds, and *Thymus vulgaris* foliage essential oils were evaluated on the adults of *T. confusum*. Pure essential oils (20  $\mu$ L.<sup>1</sup> air) were used in plastic cylinders for the bioassay. During 96 hours, the mortality percentage of the pest were recorded 0.5±0.5%, 0.0%, 0.5±0.5%, 98.95±1.04%, 0.5±0.5%, 4.0±1.4%5, and 4.0±1.63% in *C. cyminum, E. cardamomum, H. persicum, M. longifolia, R officinalis, S. aromaticum*, and *T. vulgaris* essential oils treatments, respectively. The results showed that among tested essential oils, *M. longifolia* had a great lethal effect in this low concentration, which is competitive with the conventional fumigants. Meanwhile, *S. aromaticum*, and *T. vulgaris* demonstrated low lethality on the adults but they may have better results on larvae. Other essential oils didn't make significant lethality. Therefore, this practice improves the results of fumigation with low concentration of essential oils allowing to be close to a total disinfestation.

## **Biography**

Amin Purhematy has completed his BSc at the age of 24 years from Bahonar University of Kerman and now is student of MSc and tutor of toxicology laboratory in this university. He is member of American Chemical Society and Iranian Inventors Association. Amin Purhematy has won two medals from international exhibitions of inventions. He has published 12 papers in international journals and conference proceedings.

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