

## Mite-control activity of fennel seed oils and their main components against the stored food mite, *Tyrophagus putrescentiae*

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The mite-control activities of components derived from *Foeniculum vulgare* (fennel) seed oils against *Tyrophagus putrescentiae* adults were examined using direct contact application and compared with that of the commercial benzyl benzoate, dibutyl phthalate and *N,N*-diethyl-*m*-toluamide.<sup>1-4)</sup> The biologically active constituent of the *F. vulgare* seeds was characterized as (+)-carvone by spectroscopic analyses. On the basis of LD<sub>50</sub> values, the compound most toxic to *T. putrescentiae* was naphthalene (4.28 mg/cm<sup>2</sup>) followed by dihydrocarvone (4.32 mg/cm<sup>2</sup>), (+)-carvone (4.62 mg/cm<sup>2</sup>), (-)-carvone (5.23 mg/cm<sup>2</sup>), eugenol (10.62 mg/cm<sup>2</sup>), benzyl benzoate (11.24 mg/cm<sup>2</sup>), thymol (11.42 mg/cm<sup>2</sup>), dibutyl phthalate (13.11 mg/cm<sup>2</sup>), *N,N*-diethyl-*m*-toluamide (13.53 mg/cm<sup>2</sup>), methyl eugenol (39.52 mg/cm<sup>2</sup>), myrcene (39.88 mg/cm<sup>2</sup>) and acetyeugenol (72.24 mg/cm<sup>2</sup>). These results indicate that mite-control activity of the *F. vulgare* seed oil could be caused by carvone and naphthalene of which the former is likely to be more important because it is 74.7 times more abundant than naphthalene. Carvone and naphthalene merit further study as potential stored-food mite control agents or as lead compounds.<sup>5-8)</sup>

### References

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