

The responses of *Glossina morsitans morsitans* Westwood to guaiacol (2-methoxyphenol), a mild repellent constituent of bovid odors, and seven analogues comprising 2-methoxyfuran, 2,4-dimethylphenol, 2-methoxy-4-methylphenol (4-methylguaiacol), 4-ethyl-2-methoxyphenol (4-ethylguaiacol), 4-allyl-2-methoxyphenol (4-allylguaiacol; eugenol), 3,4-methylenedioxytoluene, and 3,4-dimethoxystyrene were compared in a two-choice wind tunnel. The 4-methyl-substituted derivative (2-methoxy-4-methylphenol) was found to elicit stronger repellent responses from the flies compared with guaiacol. None of the other analogues showed significant repellent effects on flies. 4-Methylguaiacol, guaiacol, and eugenol (which was included because of previous reports of its repellency against a number of arthropods) were further evaluated in the field with wild populations of predominantly *Glossina pallidipes* Austen. The presence of guaiacol or eugenol near odor-baited traps caused some nonsignificant reduction in the number of tsetse catches at relatively high release rates (~50 mg/hr). In contrast, the 4-methyl derivative at three different release rates (2.2, 4.5, and 9.0 mg/hr) reduced trap catches of baited traps in a dose-response manner. At 10 mg/hr release rate, it reduced the catches of baited and unbaited traps by ~80 and ~70%, respectively. In addition, the compound not only reduced the number of tsetse attracted to natural ox odor (~ 80%), but also had an effect on their feeding responses, reducing the proportion that fed on an ox by more than 80%. Our study shows that the presence of a methyl substituent at the 4-position of guaiacol enhances the repellency of the molecule to savannah tsetse and suggests that 4-methylguaiacol may represent a promising additional tool in the arsenal of techniques in trypanosomiasis control.