Abstract
Recent studies have shown the spasmolytic activity of p-menthane monoterpenes (+)-pulegone and 4-terpinyl acetate (4-T) in guinea pig ileum. Since the action mechanism of these monoterpenes in intestinal smooth muscle is unknown, the present study was conducted to characterize their relaxant mechanism in isolated guinea pig ileum. We tested the involvement of voltage-dependent calcium and potassium channels and muscarinic antagonism. Both the monoterpenes caused a shift in the calcium curve to the right with reduction in the maximum effect. Pretreatment with tetraethylammonium chloride partially inhibited relaxation produced by both 4-T and (+)-pulegone. Both compounds caused a shift in the bethanechol curve to the right with reduction in the maximum effect. The results of this study indicate that the mechanisms of action of the smooth muscle relaxant monoterpenes (+)-pulegone and 4-T possibly involve the partial blockade of calcium channels, the activation of potassium channels, and the non-competitive antagonism of muscarinic receptors.

Keywords
(+)-pulegone, 4-terpinyl acetate, monoterpenes, essential oils, spasmolytic activity, ion channels, muscarinic antagonism.