

Wood creosote inhibits calcium mobilization in guinea pig colonic smooth muscle

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<和文タイトル>

木クレオソートによるモルモット結腸平滑筋内のカルシウム動員を阻害する

[Abstract]

Wood creosote, a mixture of simple phenolic compounds, has long been used as an herbal antidiarrheal medicine. Previous studies have shown that wood creosote has antimotility activity on the gastrointestinal (GI) tract, although its mechanism of action is not completely understood. The *in vitro* efficacy of wood creosote on calcium mobilization in guinea pig colonic smooth muscle was evaluated using a digital video camera system mounted on an inverted fluorescence microscope. The effects of wood creosote on spontaneous periodic increases in the free cytosolic calcium concentration ($[Ca^{2+}]_i$), acetylcholine (ACh)-enhanced periodic increases in $[Ca^{2+}]_i$, and tetrodotoxin- or nifedipine-resistant spontaneous periodic increases in $[Ca^{2+}]_i$ were evaluated. Wood creosote decreased the amplitude of spontaneous ($IC_{50}=21 \mu\text{g/ml}$) and ACh-enhanced ($IC_{50}=40 \mu\text{g/ml}$) periodic increases in $[Ca^{2+}]_i$ in guinea pig colonic smooth muscle. Wood creosote also decreased the amplitude of both tetrodotoxin- and nifedipine-resistant spontaneous periodic increases in $[Ca^{2+}]_i$. These results suggest that antimotility activity through inhibition of Ca^{2+} mobilization in the GI tract is at least partially responsible for the antidiarrheal activity of wood creosote. Wood creosote may exert its antimotility effect, at least in part, on network regions of interstitial cells of Cajal, which act as pacemaker cells and mediators of neurotransmission in the GI tract.