Antidiarrheal properties of Ligusticum chuanxiong hort's ethanol extract in mice and its impact on the contraction of rabbits' isolated jejunal smooth muscles

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Abstract: *Ligusticum chuanxiong Hort* (CR) is the dried rhizome of *Ligusticum* in Umbelliferae and belongs to the Myrtaceae family. The present study aimed to assess the antidiarrheal effects of ethanol extracts of CR (CR ext) on mice and jejunal smooth muscles isolated from rabbits. The mice were administered castor oil to induce diarrhea and the antidiarrheal effects of CR ext (250, 500 and 1000mg/kg; oral administration) were assessed *in vivo*. The impact of CR ext (0.01-10mg/mL) was examined on the spontaneous and ACh (10M)/K+ (60mM)-induced contraction of isolated rabbit jejunum smooth muscle *in vitro*. Additionally, its potential effect was examined when the jejunal muscles were pretreated with either verapamil or CR ext in a Ca²⁺-free high-K⁺ (60mM) solution containing ethylenediaminetetraacetic acid. CR ext exhibited antidiarrheal effects at a dose ranging from 500 to 1000mg·kg⁻¹. CR ext (0.01-10mg/mL) inhibited the spontaneous contraction of the smooth muscles in a dose-dependent manner and its median effective concentration (EC₅₀) was 0.43mg/mL (0.37-0.49, n=6). Furthermore, it alleviated jejunal contraction induced by ACh (10µM)/K⁺ (60mM) and EC₅₀ values were 0.32mg/mL (0.27-0.35, n=6) and 0.12mg/mL (0.10-0.14, n=6), respectively. Similar to the effect of verapamil, CR ext shifted the dose–response curve of CaCl₂ downward to the right. CR ext exerts effective antidiarrheal effects; thus, it can be a potential treatment option for gastrointestinal disorders. This finding provides a strong pharmacological basis for its use in gastrointestinal disease management.

Keywords: Ethanol extract of Ligusticum chuanxiong hort; antidiarrhea; gastrointestinal disorders