

Antispasmodic effect of osthole and *Prangos ferulacea* extract on rat uterus smooth muscle motility

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Background and Aims: Several species of *Prangos* are traditionally used as emollient, carminative, tonic, anti-flatulent, anthelmintic and anti-thrombotic agents. Osthole, a coumarin isolated from *Prangos*, are believed to be responsible for its spasmolytic activity. However so far pharmacological activity of *Prangos ferulacea* extract has not been investigated on smooth muscles. Therefore the objective of this research was to investigate the effect of *P.s ferulacea* extract on rat isolated uterus.

Methods: A day before experiment, rats were given 17- β -oestradiol (100 μ g/kg, S.C.) and housed in a cage with free access to food and water at room temperature. In this research, effects of *P. ferulacea* extract and osthole were investigated on rat isolated uterus contraction induced by KCl, acetylcholine (ACh), oxytocin and electrical field stimulation (EFS) and compared with atropine and salbutamol.

Results: *P. ferulacea* acetonetic extract concentration-dependently relaxed uterine contraction induced by KCl ($IC_{50}=13 \pm 0.81$ μ g/ml), ACh ($IC_{50}=12 \pm 1.38$ μ g/ml), oxytocin ($IC_{50}=16 \pm 3.14$ μ g/ml) and EFS ($IC_{50}=11 \pm 1.5$ μ g/ml). However, the extract at lower concentration (2.5 μ g/ml) potentiated the EFS response. Osthole only had inhibitory effect on rat uterus and its relaxant effect was observed at lower concentration in comparison with *P. ferulacea* extract. Osthole in a similar way inhibited the response to KCl ($IC_{50}=4 \pm 0.13$ μ g/ml), ACh ($IC_{50}=4 \pm 0.8$ μ g/ml), oxytocin ($IC_{50}=4 \pm 0.8$ μ g/ml) and EFS ($IC_{50}=1 \pm 0.5$ μ g/ml).

Conclusions: Our results demonstrated that osthole acted directly on uterus smooth muscle to induce relaxation, whereas *P. ferulacea* caused both contraction and relaxation of rat uterine smooth muscle. The relaxation of osthole might be mediated through Ca²⁺ channel blocking activity as it inhibited the response to KCl. Mechanisms other than Ca²⁺ channel blocking appeared to be responsible for ACh relaxation effect of osthole.

Keywords: *Prangos ferulacea*; Osthole; Uterus; EFS; KCl; ACh; Oxytocin