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, anthelminthic 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. ferulacea* extract on rat isolated uteruses.

**Methods:** A day before experiment, rats were given 17-β-oestradiol (100 µg/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 was 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* acetonic extract concentration-dependently relaxed uterine contraction induced by KCl (IC₅₀=13 ± 0.81 µg/ml), ACh (IC₅₀=12 ± 1.38 µg/ml), oxytocin (IC₅₀=16 ± 3.14 µg/ml) and EFS (IC₅₀=11 ± 1.5 µg/ml). However, the extract at lower concentration (2.5 µg/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 (IC₅₀=4 ± 0.13 µg/ml), ACh (IC₅₀=4±0.8 µg/ml), oxytocin (IC₅₀=4 ± 0.8 µg/ml) and EFS (IC₅₀=1±0.5 µg/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