

Inhibitory effect of *Rosa damascena* Mill flower essential oil, geraniol and citronellol on rat ileum contraction

H. Sadraei¹, G. Asghari², S. Emami^{1,*}

¹Department of Pharmacology & Toxicology, School of Pharmacy and Pharmaceutical Sciences, Isfahan University of Medical Sciences, Isfahan, I.R. Iran.

²Isfahan Pharmaceutical Sciences Research Center, Isfahan University of Medical Sciences, Isfahan, I.R. Iran.

Background and Aims: Flower of *Rosa damascena* Mill is widely used in Iran for gastrointestinal disorders. However, its pharmacological action on ileum contraction has not been studied. In this research we have investigated ileum motility effect of essential oil of flower petals of *R. damascena* growing in Kashan-Iran and two of its constituents.

Methods: The essential oils obtained by hydrodistillation were investigated by a combination of GC and GC/MS. A portion of rat isolated ileum was suspended under 1g tension in Tyrode's solution at 37 C and gassed with O₂. Effect of the *R. damascena* essential oil, geraniol and citronellol were studied on ileum contractions induced by KCl, acetylcholine (ACh) and electrical field stimulation (EFS) and compared with standard drugs atropine and loperamide.

Results: More than 34 compounds have been identified. The main constituents of the essential oil were β -citronellol (23%), nonadecane (16%), geraniol (16%) and heneicosane (5%). The essential oil of *R. damascena* concentration dependently inhibited the response to KCl ($IC_{50} = 67 \pm 8.4 \mu\text{g/ml}$) and EFS ($IC_{50} = 47 \pm 10.6 \mu\text{g/ml}$). Geraniol and citronellol also inhibited ileum contraction induced by KCl ($IC_{50} = 1.7 \pm 0.15 \mu\text{g/ml}$ and $2.9 \pm 0.3 \mu\text{g/ml}$ respectively) and EFS ($IC_{50} = 1.5 \pm 0.19 \mu\text{g/ml}$ & $5.4 \pm 0.9 \mu\text{g/ml}$ respectively). Inhibitory effect of geraniol ($IC_{50} = 7.5 \pm 1.2 \mu\text{g/ml}$) and citronellol ($IC_{50} = 1.7 \pm 0.13 \mu\text{g/ml}$) on ileum contraction induced by ACh were more potent than the essential oil. The contractile response of EFS was mediated mainly through the intramural nerve plexuses, because its response was inhibited by loperamide and partially reduced by atropine.

Conclusions: From this experiment it was concluded that *R. damascena* essential oil mainly had an inhibitory effect on ileum contractions and geraniol and citronellol had played a major role in inhibitory action of the essential oil. These experiments support the use of rose water (Golab) as antispasmodic remedy for treatment of intestinal spasm.

Keywords: *Rosa damascene*; Essential oil; Geraniol; Citronellol; Ileum