

# Food and Beverages

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## Can xylene and chia (*Salvia hispanica L.*) seed extract directly affect basic ovarian cell functions?

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Exposure to xylene is associated with the dysfunction of mammalian female reproduction. Some medical plants, in particular *Salvia hispanica L.* (chia), promote reproductive processes, but it is unknown, whether they can prevent negative influence of environmental contaminant on reproductive processes. In this *in vitro* study we elucidated the effects of xylene, chia, and xylene/chia combination on basic bovine ovarian granulosa cell functions (proliferation, apoptosis, and hormone release). Proliferation and apoptosis were assessed via immunocytochemistry by evaluation of PCNA and BAX accumulation. The release of progesterone, testosterone and insulin-like growth factor IGF-I was analyzed by RIA. It was observed, that xylene when given alone stimulated proliferation but not apoptosis. Furthermore, xylene inhibited release of progesterone and testosterone but did not change IGF-I release. Chia seed extract inhibited proliferation, apoptosis and the release of IGF-I, progesterone and testosterone. Moreover, chia seed extract suppressed the stimulatory effect of xylene on proliferation but induced pro-apoptotic effect of xylene. The obtained results demonstrate a direct effect of both xylene and chia seed extract on basic bovine ovarian cell functions - proliferation, apoptosis and secretory activity. Moreover, it is the first demonstration of the ability of chia to suppress xylene action on ovarian cell proliferation. On the other hand, chia prevented only one xylene effect among five analyzed ones suggesting that chia could not be potentially useful for natural prevention of all negative effects of xylene on reproduction.

### Recent publications

1. Földešiová M, Baláži A, Chrastinová L, Pivko J, Kotwica J, Harrath A H, Chrenek P and Sirotkin A V (2017) *Yucca schidigera* can promote rabbit growth, fecundity, affect the release of hormones *in vivo* and *in vitro*, induce pathological changes in liver, and reduce ovarian resistance to benzene. *Anim Reprod Sci.* 183:66-76.
2. Sirotkin A V and Harrath A H (2017) Influence of oil-related environmental pollutants on female reproduction. *Reprod Toxicol.* 71:142-145.
3. Sirotkin A V (2011) *Regulators of ovarian functions.* Nova Science Publishers, Inc. Hauppauge, NY (USA), ISBN: 978-1-61668-040-4.
4. Štochmal'ová A, Földešiová M, Baláži A, Kádasi A, Grossmann R, Alexa R, Chrenek P and Sirotkin A V (2015) *Yucca schidigera* extract can promote rabbit fecundity and ovarian progesterone release. In: *Theriogenology.* doi: 10.1016/j.theriogenology.2015.04.024.

### Biography

Adam Tarko has experience in research of plant and plant substances, which can improve animal and human reproduction and to prevent the action of environmental contaminants. He gained experience while studying at Slovak Agriculture University and Constantine the Philosopher University in Nitra up to now. His current research is under the guidance of Prof. RN Dr. Alexander Sirotkin, Dr.Sc., investigating effect of petrochemical contaminants, plant substances and their potential oil-related protection on animal and human reproduction.

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