Effect of methanolic extract of *Hedera nepalensis* K. Koch on reproductive system of male rats: A histological and biochemical study

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Abstract

Statement Background: Traditionally, herbal medicines have long been practiced worldwide to prevent different diseases for centuries. *Hedera nepalensis* is a genus of flowering plant used against diabetes, fever, pulmonary infections and rheumatism. It is also used as antifertility agent in men in different regions of the world. However, the knowledge about antifertility potential of the plant is unknown. Purpose: This study was designed to evaluate effects of methanolic leaf extract of *Hedera nepalensis* K. Koch on reproductive system of male rats. Study design: For this, in vitro experimental approach was used to see direct effect of different concentrations of plant extract on testicular antioxidant status, testosterone secretion and sperm DNA integrity. In sub chronic experiment, rats were exposed to different doses of plant extract for twenty eight days. Methods: Fertility test, Sperm DNA integrity, biochemical parameters (catalase, superoxidase dismutase, peroxidase, ROS and TBARS) and plasma hormonal concentrations (testosterone, LH and FSH) were evaluated. In addition, histology of testicular and epididymal (caput and cauda) tissues was performed. Results: Results of in vitro experiment revealed significantly increased oxidative stress and DNA damage with reduced testosterone concentration in highest dose regimen (1000 µg/mL). In vivo study exhibited marked reduction in antioxidant enzymes activity and elevation in ROS and TBARS concentrations in high dose treated groups. Histopathological observations of testis and epididymis showed tubules with damaged epithelium and less number of spermatozoa in lumen of high dose treated animals. In addition, significant reduction in plasma testosterone, LH and FSH concentrations were also noted. Fertility test found reduced pregnancy outcome in the females paired with treated male rats and litter size was also significantly reduced. Conclusion: It is concluded that the methanolic leaf extract of *Hedera nepalensis* has the potential to induce oxidative stress and cause DNA damage leading to suppression of male fertility that can be restored after treatment withdrawal.



Recent Publications

1. Ain, Qurat-Ul, **Mehwish David**, Qasim Shah, Mushtaq Ahmad, and Sarwat Jahan. "Antifertility effect of methanolic leaf extract of *Chenopodium ambrosioides* Hook. in male Sprague Dawley rats." Andrologia 50, no. 10 (2018): e13129..
2. **David, Mehwish**; Ain, Qurat; Ahmad, Mushtaq; Zaman, Wajid; Jahan, Sarwat. "A biochemical and histological approach to study antifertility effects of methanol leaf extract of *Asplenium dalhousiae* Hook. in adult male rats." Andrologia. (Accepted)
3. Naham, Waheed Ullah, **Mehwish David,** Humaira Rehman, Sarwat Jahan. "Comparative Study of Environmental Pollutants Bisphenol A and Bisphenol S on Sexual Differentiation of Anteroventral Periventricular Nucleus and Spermatogenesis: A Focus on their Potential Involvement as an Estrogenic Endocrine Disruptor. Toxicology reports (2018). Under Review
4. Humaira Rehman; Qurat-ul- Ain**; Mehwish David**; Imdad Ullah, Sarwat Jahan. "Neonatal exposure to furan alters development of reproductive systems in adult male Sprague Dawley rats." Food and Chemical Toxicology (2019) Under Review



Biography

Miss Mehwish David is a competent and dedicated to her work. She is a PhD scholar and visiting lecturer at Quaid-i-Azam University Islamabad, Pakistan. She is currently doing research in Reproductive physiology laboratory, Quaid-i-Azam University Islamabad. Her area of interest is reproductive toxicology, neuroendocrinology, androgen receptors, infertility, andrology, contraception and neuroendocrine control of reproduction. She has expertise in animal handling, dissection and performing various laboratory protocol. Moreover her outstanding academic and practical experiences make her diligent and different from others.

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