

## Evaluating the effects of *Centella asiatica* on spermatogenesis in rats

Heidari M. (M.Sc.)<sup>1,2</sup>, Jamshedi A.H. (Ph.D.)<sup>3</sup>, Akhondzadeh Sh. (M.D.)<sup>4</sup>, Ghaffari Novin M. (M.D., Ph.D.)<sup>1</sup>, Sadeghi M.R. (Ph.D.)<sup>1</sup>, Ghazi Khansari M. (Ph.D.)<sup>4</sup>, Akhondi M.A. (Ph.D.)<sup>1,5</sup>

1- Reproductive Biotechnology Research Center, Avesina Research Institute, ACECR, Tehran, Iran.

2- Nanobiotechnology Research Center, Avesina Research Institute, ACECR, Tehran, Iran.

3- Ministry of Health & Medical Education, Tehran, Iran.

4- Faculty of Medicine, Medical Sciences / Tehran University, Tehran, Iran.

5- Monoclonal Antibody Research Center, Avesina Research Institute, ACECR, Tehran, Iran.

### Abstract

**Introduction:** Based on supportive aids of WHO in the field of public health, family planning and reproductive health, consumption of herbal drugs has been considered as an alternative to synthetic contraceptive drugs. *Centella asiatica* has been traditionally used for the treatment of different types of diseases for thousands of years in various parts of the world including Eastern Asia, China and India. Considering the dispersal of this plant in Bandar Anzali's wetlands and lack of research on the effects of this plant on reproductive system in laboratory models, this study was carried out to evaluate the effects of *Centella asiatica* extract on spermatogenesis and testicular tissue of rats.

**Materials & Methods:** At first, the plant was collected and its extract was prepared through percolation process. Some 8 to 10-week old male Wistar rats, weighing about 200-250 grams, were selected randomly and were divided into 6-member subgroups. The rats in the control group received water, the sham group received Tween solvent and the third to the sixth groups received non-fatal doses of 10, 50, 80 and 100mg/kg of the crude extract for 60 days respectively. On the 61st day, the rats were dissected and their testes were taken out and weighed for probable effects of the extract on the organ's weight. Then sperm parameters and histological evaluations of the testes were done. The results were analyzed by the use of SPSS and Pharm softwares by calculation of one-way ANOVA while considering  $p < 0.05$  as the significance level.

**Results:** The LD<sub>50</sub> of the plant was calculated as 500mg/kg, with a confidence interval of 1.9- 2.2 in male rats. The non-lethal doses of 10, 50, 80 and 100 mg/kg of *Centella* extract were considered for histological and spermatogonial evaluations. There were significant increases in body and testis weight in rats receiving the extract compared to the control and sham groups. There were histological changes during spermatogonial evolution such as degeneration of spermatozoa and interstitial congestion in some tubules and sperm analysis showed a meaningful decrease in the number of spermatozoa ( $p < 0.01$ ), motile sperms ( $p < 0.001$ ) and epididymal sperm storage ( $p < 0.001$ ) compared to the sham and control groups but there were no changes in sperm morphology.

**Conclusion:** Based on the above results, it seems that *Centella asiatica* can be used as a temporary contraceptive agent in animals. Nevertheless, more biochemical and molecular research on the contraceptive effects of this extract is needed to determine its economical benefits and prepare an appropriate formulation.

**Key Words:** Rat, Sperm, Spermatogenesis, LD<sub>50</sub>, *Centella asiatica*, Contraceptive, Fertility.

**Corresponding Author:** Mahnaz Heidari, Reproductive Biotechnology Research Center, Avesina Research Institute, ACECR, Evin, Shahid Beheshti University, P.O.Box 19835-177, Tehran, Iran.

**E-mail:** mheidari@avesina.ac.ir