

SUBACUTE EXPOSURE TO DIBUTYL PHTHALATE RESULTS IN AN INCREASED NUMBER OF OVARIAN CORPUS LUTEUM IN FEMALE WISTAR RATS

Jelena Vukčević, Ivana Ivelja, Nebojša Andrić, Jelena Marković Filipović

*Department of Biology and Ecology, Faculty of Sciences, University of Novi Sad, Trg
Dositeja Obradovića 2, Serbia
e-mail: jelena.karan@dbe.uns.ac.rs*

Abstract.

Dibutyl phthalate (DBP) is a phthalic acid ester, widely used as a plasticizer to add flexibility to plastics. Due to its weak chemical bonding with polymer products, DBP can easily be released into the environment. It has been shown that DBP act as an endocrine disruptor with estrogenic activity, primarily targeting the ovary.

The objective of this study was to determine whether a subacute exposure to DBP affects the number of ovarian corpus luteum.

Twenty-four female Wistar rats, 40 days old at the beginning of the experiment, were divided into four groups (6 rats per group). They underwent subacute exposure for 28 days with DBP incorporated into their diet at doses of 0, 100, 500 and 5000 mg DBP/kg diet, that correspond to 8.58, 41.34 and 447.33 mg/kg BW/day. Bouin's-fixed ovaries were embedded in paraffin and then serially sectioned into 5 μm slices. The slides were stained with hematoxylin and eosin. The numbers of ovarian corpus luteum were determined under Olympus light microscope. Statistical analysis was performed using STATISTICA® version 13.0 (StatSoft, Inc). Data from control and treated rats were compared using One-way analysis of variance (ANOVA) for multiple comparisons, followed by Tukey post-hoc tests.

Statistical analysis revealed no differences in the number of corpus luteum in the group exposed to 100 mg DBP/kg diet when compared with control group. However, in the group exposed to 500 and 5000 mg DBP/kg diet, a significant increase in the number of corpora lutea was observed.

The results indicated that short-term exposure to higher doses of DBP result in an elevated number of ovarian corpus luteum. Based on these data, we can infer that under these experimental conditions, DBP has the capacity to induce accelerated ovarian aging.