

## Histological Changes in the Uterus of the Hens After Embryonic Exposure to Bisphenol A and Diethylstilbestrol

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It has been extensively investigated that environmental estrogens have adverse effects on mammals, development and function of reproductive organs of birds. In spite of the fact that effects of administration of environmental estrogens at high dose are investigated, the effects of the administration at low dose is not apparently seen. In this study, the development of embryo, given Bisphenol A (BPA) an environmental estrogen and Diethylstilbestrol (DES) a synthetic estrogen in embryonal period, and their uterus in adult are examined by histological methods.

Five groups have been formed in our study. In ovo only vehicle substance in control group and in experimental groups, BPA (67  $\mu$ g/g and 134  $\mu$ g/g) and DES (0,02  $\mu$ g/g and 0,2  $\mu$ g/g) were injected. In the twenty first week, specimens were taken from uterus of hens.

Uterus specimens was fixed in 10% buffered formaldehyde and after routine tissue processing methods tissues were embedded in parafin and cut 5  $\mu$ m thickness. Crossman's Triple Stain, PAS, AB, performic acid/ AB colouring were applied to the prepared paraffin sections and ER $\alpha$  receptor were labelled.

For density measurements of the uterine glandular tissue, a graticule with 100 points was used. Three uterus sections were evaluated for each animal. Five mucosal foldings in uterus sections were selected randomly. The density of the glandular tissue in uterus was determined by measuring the glandular area in a uterine mucosal fold and relating it to the total area of the fold.

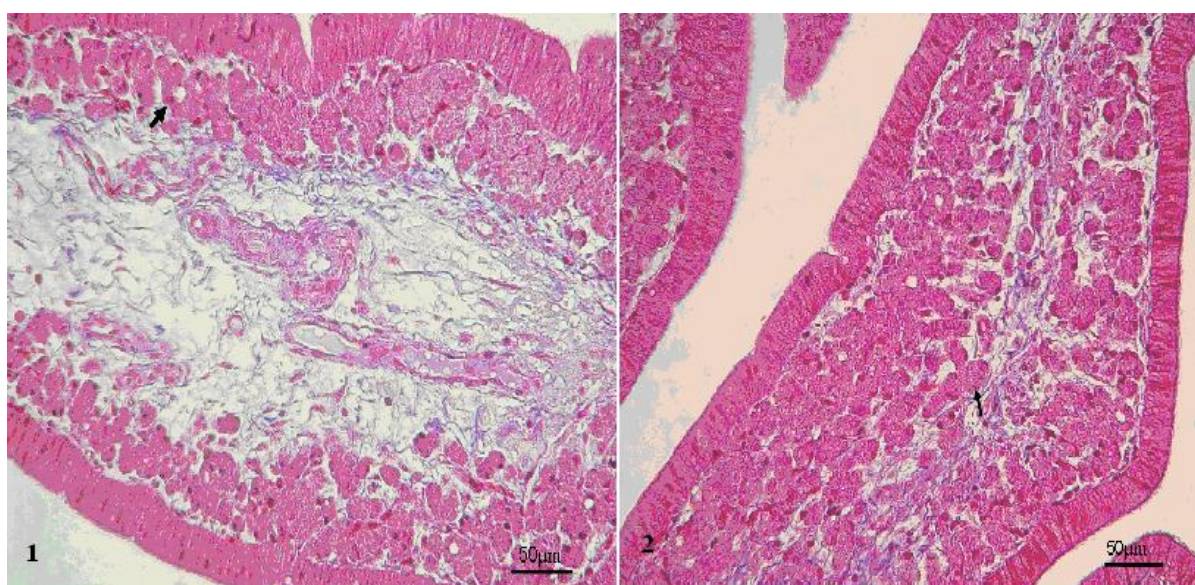
As a result of the research, it was observed that the hatching proportion in BPA (67  $\mu$ g and 134  $\mu$ g/g) was lesser than the other groups ( $P < 0,01$ ). In BPA (134  $\mu$ g/g) and DES (0,2  $\mu$ g/g) groups, uterine tubular glandular density and thickness of tunica mucosa were getting lesser than that of control and other experimental groups ( $P < 0,01$ ). ER $\alpha$  receptor, in uterine glands epithelium were labelled as positive. Our results indicated that administration of BPA and DES at high dose affects embryo development in a negative way and this adverse effect was seen less in adult period.

1. T. Colborn et al., Environmental Health Perspectives. **101** (1993) p378-384
2. C. Berg et al., Environmental Toxicology. **20** (2001) p2826-2840.

**Table 1:** Statistical evaluation of groups according to uterine glandular density( %)

GROUP	Animal number (n)	Uterine glandular density (%)
		$\bar{x} \pm S_{\bar{x}}$
Control	5	41,23±0,73 <sup>a</sup>
BPA low dose	5	38,82±2,10 <sup>a</sup>
BPA high dose	5	37,92±2,04 <sup>b</sup>
DES low dose	5	42,04±0,86 <sup>a</sup>
DES high dose	5	35,75±1,01 <sup>b</sup>
		**

The difference among groups is significant. \*\*= P<0,01



**Figure1.** Mucosal fold of uterus from hen in high dose BPA(134 µg) group. Arrow: uterine gland.

**Figure 2.** Mucosal fold of uterus from a hen in control group. Arrow: uterine gland.