**Hematological and antioxidant biomarkers alterations in male albino rats treated with bisphenol A: The protective impact of vitamin E**

Amal F. Mahraan, Mohamed F. El-Sayed\*, Tito N. Habib, Mohamed Alaraby

*Zoology Department, Faculty of Science, Sohag University, Sohag 82524, Egypt*

*\*Email: mohamed\_farag@science.sohag.edu.eg*

**Table S1:** The impact of Bisphenol A (BPA), Vitamin E (Vit. E) and Vit. E + BPA on **Hematological Parameters** in Male Albino rats (*Rattus rattus*); The sign (•) is used to show non-significant p ≥ 0.05, The sign (\*) is used to show significant difference for control group with p ≥ 0.05 and the sign (°) is used to show significant difference for Bisphenol A group with p ≥0.05

| **Parameter** | **Control** | **BPA** | **P Value** | **Vit. E** | **P Value** | **Vit. E+ BPA** | **P Value** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| RBCs (x106 /UL) | 7.6 ±0.591 | 6.33 ±0.166\* | 0.02 | 7.78 ±0.526●○ | 0.46  0.02 | 7.36 ±0.964●● | 0.35  0.59  0.22 |
| Hemoglobin (g/dl) | 14.22 ±0.512 | 13.2 ±0.681\* | 0.002 | 14.12 ±0.319●○ | 0.61  0.01 | 14.42 ±0.431●○ | 0.14  0.001  0.03 |
| Hematocrit (%) | 40.6 ±0.452 | 37.18 ±1.543\* | 0.001 | 42.72 ±2.264●○ | 0.07  0.003 | 41.6 ±1.319●○ | 0.08  0.002  0.45 |
| MCV (fL) | 82.52 ±2.19 | 85.6 ±2.069\* | 0.41 | 82.38±1.289●○ | 0.001  0.14 | 82.47 ±0.829●○ | 0.95  0.17  0.003 |
| MCH (Pg) | 31.48 ±0.919 | 35.4 ±0.817\* | 0.001 | 34.9 ±1.549\*● | 0.008  0.37 | 35.6 ±0.994 \*● | 0.001  0.67  0.15 |
| MCHC (g/dl) | 35.82 ±1.187 | 32.07±1.093\* | 0.001 | 36.80 ±2.634●○ | 0.008  0.37 | 35.27 ±2.855●○ | 0.001  0.67  0.14 |
| RDW (%) | 13.28 ±0.598 | 14.6 ±0.374\* | 0.17 | 13.93 ±0.327●○ | 0.01  0.59 | 13.43 ±0.753●○ | 0.02  0.19  0.25 |

**Table S2:** The impact of Bisphenol A (BPA), Vitamin E (Vit. E), and Vit. E + BPA on **PLT, MPV, WBCs and leukocytic differentional counts.** in Male Albino rats (*Rattus rattus*); The sign (•) is used to show non-significant p ≥ 0.05, The sign (\*) is used to show significant difference for control group with p ≥ 0.05 and the sign (°) is used to show significant difference for Bisphenol A group with p ≥ 0.05

| **Parameter** | **Control** | **BPA** | **P Value** | **Vit. E** | **P Value** | **Vit. E+ BPA** | **P Value** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Platelets (x103 / UL) | 276.4 ±17.73 | 254.33 ±13.25\* | 0.03 \* | 281.27 ±24.54 | 0.57 ●  0.34 ● | 294.33 ±39.75 | 0.002 \*  0.004 **◦**  0.01 ° |
| MPV (fL) | 9.66 ±0.77 | 7.23 ±0.432\* | 0.32 ● | 9.97 ±0.817 | 0.85 ●  0.62 ● | 9.51 ±0.728 | 0.03 \*  0.03 °  0.07 ° |
| WBCs (x103 / UL) | 10.95 ±0.641 | 12.75 ±0.718\* | 0.005 \* | 10.33 ±0.802 | 0.72 ●  0.003 ° | 10.58 ±0.523 | 0.23 ●  0.0002 °  0.11 ● |
| Neutrophils (%) | 6.79 ±0.397 | 7.97 ±0.403\* | 0.014 \* | 6.41 ±0.497 | 0.025 \*  0.03 ° | 6.56 ±0.324 | 0.003 \*  0.07 °  0.006 ◦ |
| Lymphocytes (%) | 3.36 ±0.261 | 3.83 ±0.215\* | 0.0003 \* | 3.10 ±0.24 | 0.91 ●  0.004 ° | 3.18 ±0.157 | 0.66●  0.04 °  0.52 ● |
| Monocytes (%) | 0.58 ±0.034 | 0.67 ±0.033\* | 0.005 \* | 0.55 ±0.043 | 0.83 ●  0.003 ° | 0.56 ±0.028 | 0.22 ●  0.0002 °  0.11 ● |
| Eosinophils %) | 0.25 ±0.015 | 0.29 ±0.017\* | 0.005\* | 0.24 ±0.027 | 0.73 ●  0.003 ° | 0.24 ±0.012 | 0.23 ●  0.0002 °  0.18 ● |
| Basophils (%) | 0.44 ±0.027 | 0.510 ±0.03\* | 0.01 \* | 0.41 ±0.032 | 0.54 ●  0.003 ° | 0.42 ±0.02 | 0.13 ●  0.0003 °  0.09 ● |

**Table S3:** The impact of bisphenol (BPA),), Vitamin E , and Vit.E + (BPA) on oxidative stress parametersin male Albino rats (*Rattus rattus*); The sign (•) is used to show non-significant p ≥ 0.05, The sign (\*) is used to show significant difference for control group with p ≥ 0.05 and The sign (°) is used to show significant difference for bisphenol group with p ≥0.05.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Control** | **BPA** | **P Value** | **Vit. E** | **P Value** | **Vit. E+BPA** | **P Value** |
| LPO (nmol/ml) | 10.38 ±0.449 | 12.65 ±0.207\* | 0.07 \* | 8.85 ±0.378 | 0.71 ●  0.0008 ° | 10.77 ±3.284 | 0.47 ●  0.41 ●  0.19 ● |
| SOD (U /ml) | 1.38 ±0.35 | 2.6 ±0.11\* | 0.002 \* | 2.23 ±0.571 | 0.02 \*  0.33 ● | 2.4 ±0.683 | 0.03 \*  0.62 ●  0.52 ● |
| CAT (U /L) | 236.35 ±6.490 | 147.56 ±4.58\* | 0.002 \* | 241.72 ±3.631 | 0.55 ●  0.00001 ° | 246.05 ±7.122 | 0.78●  0.00007 °  0.30● |
| GR (U/L) | 389.87 ±1.56 | 1621.92 ±184.04\* | 0.0009 \* | 1247.45 ±75.51 | 0.0002 \*  0.04 ° | 1254.18 ±17.736 | 0.02 \*  0.034°  0.88● |