

## PD17: Low Level Cadmium Exposure Causes Pectoral Fin and Cranial Fluctuating Asymmetry in *Oreochromis mossambicus* X *O. niloticus*

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### ABSTRACT

**Introduction:** One of the indicator for developmental instability in an organism in fluctuating asymmetry (FA). Prolonged exposure to cadmium is believed to cause developmental instability via the manifestation of fluctuating asymmetry. **Method:** This study was conducted to observe the effect of low level cadmium exposure on the fluctuating asymmetry in *O. mossambicus* X *O. niloticus*. The fish were exposed to three different concentrations of cadmium (0.05 mg/L, 0.01 mg/L and 0.05 mg/L) for 3 months. Pectoral fin fluctuating asymmetry (FA<sub>pectoral fin</sub>) and cranial fluctuating asymmetry (FA<sub>cranial</sub>) were measured every month. **Results:** There were significant increase in FA<sub>pectoral fin</sub> in all treatment groups as compared to control group. Fish exposed to 0.05 mg/L Cd showed the highest increase in FA<sub>pectoral fin</sub> while those exposed to 0.05 mg/L Cd showed the least increase. The difference values between treatment and between exposure duration were significant ( $p < 0.05$ ). Similar trends were also observed in FA<sub>cranial</sub>. Fish exposed to 0.05 mg/L Cd showed the highest increase while those exposed to 0.05 mg/L Cd showed the least increase. **Conclusion:** Low level cadmium exposure is shown to induce developmental instability by increasing both pectoral fin fluctuating asymmetry and cranial fluctuating asymmetry in *O. mossambicus* X *O. niloticus*.

### KEY WORDS:

Cadmium; fluctuating asymmetry; *Oreochromis mossambicus* X *O. niloticus*

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## PD18: *Piper sarmentosum* Stimulates Dimethylarginine Dimethylaminohydrolase Activity in Human Umbilical Vein Endothelial Cells

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### ABSTRACT

**Introduction:** Asymmetric dimethylarginine (ADMA) is an endogenous nitric oxide (NO) synthase inhibitor which has been associated with cardiovascular mortality in various clinical settings. Elimination of ADMA is achieved mainly by the action of dimethylarginine dimethylaminohydrolase (DDAH). Piper sarmentosum (PS) is an herb which stimulates endothelial NO production. This study will determine whether the positive effects of PS on NO production is related to its effect on DDAH and ADMA in human umbilical vein endothelial cells (HUVEC). **Method:** HUVEC were divided into four groups: control, treatment with 30 ng/ml of tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ), treatment with 250  $\mu$ g/ml of aqueous extract of PS and concomitant treatment with PS and TNF- $\alpha$  for 24 hours. HUVEC were collected and DDAH activity was measured using colorimetric assay while ADMA level was measured using enzyme-linked immunosorbent assay (ELISA). **Results:** TNF- $\alpha$ -induced HUVEC showed reduction in DDAH activity compared to control ( $p < 0.05$ ). Treatment with PS successfully increased DDAH activity in TNF- $\alpha$ -induced HUVEC ( $p < 0.05$ ). Induction with TNF- $\alpha$  also caused an increase in ADMA level ( $p < 0.05$ ) whereas treatment with PS was able to reduce ADMA level in TNF- $\alpha$ -induced HUVEC ( $p < 0.05$ ). **Conclusion:** Piper sarmentosum reduces ADMA level by stimulating DDAH activity in TNF- $\alpha$ -induced HUVEC.

### KEY WORDS:

*Piper sarmentosum*, Asymmetric dimethylarginine, Dimethylarginine dimethylaminohydrolase, Nitric oxide.