



ASSESSMENT OF GENOTOXICITY OF TWO CADMIUM SALTS IN *Eisenia andrei* (ANDRE, 1963) USING THE COMET ASSAY

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ABSTRACT

Cadmium pollution of soil is widespread across the globe and has caused biological problems. In polluted soils, earthworms are exposed to cadmium via absorption throughout their intestinal epithelium into the coelomic cavity posing major health challenges to them. The comet assay is effective in determining the levels of DNA damage induced in earthworms by heavy metals. Current study aimed to evaluate cadmium salts induced genotoxicity in *Eisenia andrei* coelomocytes using alkaline comet assay. Earthworms (n= 10 per group) were exposed to different series (0, 3, 100, 900 mg a.i / kg dry soil) of two cadmium salts; cadmium chloride (CdCl₂) and cadmium sulphate (CdSO₄) for 28 days. Field collected natural soil was used as the substrate in all treatments (0, 3, 100, 900 mg a.i / kg dry soil). Coelomic cells were harvested from the earthworms and subjected to lysis. Upon electrophoresis, DNA migration was determined using mean comet tail length (μm). In both cadmium salts comet length increased progressively with increasing Cd concentrations. Coelomocytes from earthworms, exposed to 3 mg and 100mg of CdSO₄ showed a significant (P<0.01) increase in comet length (3mg: 10.75±0.18μm; 100mg: 11.20 ±0.26μm respectively) when compared to the control (3.50 ± 0.45 μm). Earthworms exposed to 3mg and 100 mg of CdCl₂; formed comet tails (10.65 ± 0.19 μm and 11.50 ± 0.24 μm respectively) significantly (P<0.01) higher than that of the control (5.00 ± 0.73 μm). Nine hundred mg a.i /kg dry soil dose of both salts caused the highest DNA damage as measured by the comet length formed with CdCl₂ causing the greatest damage (39.60 ±2.200μm) than CdSO₄ (28.14 ±1.81μm). Present data suggested that in these experimental conditions coelomocytes light fraction may represent a more sensitive biomarker of genotoxic insult. Further, it suggests that earthworms may be useful indicator organisms to assess genotoxic risks of cadmium pollution.

Keywords Comet assay. Earthworms. Genotoxicity. *Eisenia andrei*.

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