the near-UV-light induced degradation of DNA in presence of CPZ.

If, however, near-UV-light irradiated CPZ (45 min irradiation) was added to unirradiated DNA (final concentrations DNA 50 $\mu$g/ml, CPZ 100 $\mu$g/ml), a fall in viscosity of the DNA was observed up to 10 min after addition of the irradiated drug. After 10 min the rate of fall gradually slowed down; after 25 min $\eta'_{sp}/\eta_{sp}$ was about 0.70.

In the case of photoinduced haemolysis of RBC in presence of CPZ, Kochever and Lamola[3] observed that photoproducts of CPZ were able to haemolyse RBC possibly by membrane damage.

Our preliminary results also indicate that near-UV-light induced damage to DNA in presence of CPZ is primarily due to the products of CPZ produced during irradiation. However, the products are yet to be identified clearly.

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## *IN VITRO* STUDIES ON THE EFFECT OF CADMIUM ON GOAT EYE LENS

V. K. SRIVASTAVA, D. C. PANDEY and N. VARSHNEY
*Department of Chemistry, University of Gorakhpur, Gorakhpur 273 009, India.*

ENVIRONMENTAL pollution by toxic metals is of global significance. Among the many toxic materials, cadmium, a non-essential element, has in recent times posed serious problems to both occupational health and community health[1]. Cadmium manifests its toxicity in humans and animals by accumulating in almost all organs. Kidney is the main target, where it is concentrated mainly in the cortex[2]. Cadmium is also toxic to the central nervous system, causes alteration of cellular functions in the lungs and affects both humoral and cell-mediated immune response in animals[3]. Whereas the toxic effects of cadmium have been related to specific chemical and physical properties of the ion[4], the molecular nature of defects in fundamental biochemical processes that are directly related to the toxicity of cadmium is yet to be understood. In this communication we report the effect of cadmium on ascorbic acid, glutathione (GSH) and proteins of goat eye lens.

Fresh goat eyes were obtained from a local butcher and were transported to the laboratory in an ice box. The lenses were dissected from the eyeballs by the posterior approach method. Each lens was weighed and incubated in a plastic petri dish containing 10 ml of tissue culture medium (pH 7.4) with or without cadmium chloride in the concentration range 20–500 $\mu$M for 10 h. The lenses were then taken out, wiped free of medium and weighed again. Lenses were individually and separately homogenized in 0.1 M Tris buffer (pH 7.4), and GSH[5], ascorbic acid[6], and total, soluble and insoluble protein[7] were determined.

Lenses incubated without cadmium chloride were clear and transparent whereas lenses incubated in medium containing cadmium showed a whitish appearance on the surface. Changes in biochemical properties are listed in table 1. The pH of the medium before and after incubation did not change and remained in the range 7.28–7.34. The average weight determined from almost similar-sized lenses was $1275.8 \pm 37.3$ mg. Average total protein was about 395 mg per lens and the ratio of soluble protein to total protein was about 0.5. Increasing the concentration of $Cd^{2+}$ in the medium did not affect

**Table 1** *Effect of cadmium on levels of ascorbic acid, GSH, and soluble and insoluble proteins in goat lens incubated in Tris buffer (0.1 M, pH 7.4)*

| Concentration of $CdCl_2$ ($\mu$M) | pH of medium | Ascorbic acid ($\mu$g/100 mg wet weight of lens) | GSH ($\mu$g/mg wet weight of lens) | Soluble protein (mg) | Insoluble protein (mg) | Ratio insoluble protein/soluble protein |
|---|---|---|---|---|---|---|
| Nil | 7.34 | 65.2 ± 4.8 | 2.71 ± .24 | 199.5 ± 13.8 | 194.8 ± 12.7 | 0.98 |
| 500 | 7.30 | 64.3 ± 5.2 | 2.16 ± .20 | 181.4 ± 14.7 | 211.3 ± 13.3 | 1.16 |
| 200 | 7.26 | 61.4 ± 3.9 | 1.97 ± .27 | 173.3 ± 12.9 | 224.2 ± 12.8 | 1.29 |
| 100 | 7.30 | 58.7 ± 4.4 | 1.63 ± .21 | 161.7 ± 11.6 | 231.7 ± 12.6 | 1.43 |
| 50 | 7.29 | 56.4 ± 4.6 | 1.44 ± .20 | 140.9 ± 12.8 | 256.9 ± 14.3 | 1.82 |
| 20 | 7.28 | 53.6 ± 4.7 | 1.15 ± .22 | 109.6 ± 14.2 | 287.4 ± 12.8 | 2.62 |

the ascorbic acid content of the lens by much, as it decreased by only 18%, but the GSH content decreased by 58%. Similarly, significant changes were observed in the levels of soluble protein and insoluble protein, which decreased by 45% and increased by 48% respectively. The ratio of insoluble to soluble protein also increased from about 1.0 to 2.6.

These results are of significance as they bear a relationship with the development of lens opacity with the eventual formation of cataract. Decrease in lens GSH[8] and ascorbic acid[9] is common in cataract formation. The same is true of decrease in soluble protein and increase in insoluble protein[10]. GSH is a sulphur-containing tripeptide and is involved in a variety of oxidation–reduction reactions. It is likely that the observed large decrease in GSH is due to increased oxidation of GSH in reactions caused by cadmium toxicity. Ascorbate free radical[11] in the medium regenerates ascorbic acid and it is possible that because of this regeneration of ascorbata, the level of ascorbate in the lens decreases very slowly.

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