2 SCOPE OF THE PRESENT STUDY

There is an increasing concern that environmental contaminants affect the male reproduction of humans and wildlife resulting in decreased sperm counts and increased testicular and prostate cancer in men. Environmental contaminants such as organochlorine pesticides, polychlorinated biphenyls, dioxins, phytoestrogens, alkylphenol ethoxylates and other xenoestrogens enter into humans through food, drinking water, air and skin contact. Bisphenol A, one of the environmental contaminants used in the manufacture of plastics and other products, is released largely into the environment. Accumulation of bisphenol A in male reproductive organs has some clinical implications since exposure to bisphenol A during fetal life has been shown to cause reproductive toxicity. In the present study bisphenol A was administered orally since humans get exposed through plastic beverage containers and from saliva of patients receiving dental sealants.

The issue of the effect of low doses of bisphenol A on male reproduction is controversial. Some reports have shown low doses of bisphenol A to cause reproductive toxicity, while such changes were not observed by many others. The present study was undertaken to address this issue and adult rats were administered with bisphenol A orally with higher doses for short-term and low doses for long-term and their effects were observed on various parameters of male reproductive function. However, the nature and mechanism of action of bisphenol A on male reproduction remains unclear. Recently, many environmental contaminants have been reported to induce reactive oxygen species generation in the tissues of male reproductive system, thereby causing sub-fertility. The present study also sought to evaluate the effect of short-term and long-term exposure to bisphenol A on the antioxidant system of testis and epididymis of rats. Non-reproductive tissues like liver and kidney were taken as controls. Vitamin C, a known natural antioxidant was co-administered along with
bisphenol A in order to evaluate its protective effect against bisphenol A-induced alterations in testis and epididymis of rats.

In the present study body weight of the rats were recorded to monitor the general health status of the animal. The weights of testis, epididymis and accessory sex organs were taken to evaluate the effect on testicular functions and to assess the bioavailability and/or production of androgen and the cumulative effect of androgenic activity. Pituitary and testicular hormones were assayed to evaluate the hormonal status in the bisphenol A-treated rats. Epididymal sperm viability, sperm motility and sperm count were done to assess the epididymal function. The activities of antioxidant enzymes such as superoxide dismutase, catalase, glutathione reductase and glutathione peroxidase and the levels of hydrogen peroxide and lipid peroxidation were determined in testis, epididymal sperm and epididymis to assess the antioxidant system. Co-administration of vitamin C and bisphenol A was done in order to assess if vitamin C provides any protective effects against bisphenol A-induced toxicity in various tissues of rats.