

## P R E F A C E

The laboratory of animal physiology, University Department of Zoology, Shivaji University, Kolhapur (Maharashtra), India, has been actively engaged in extensive work on uranyl nitrate toxicity and experimentally induced acute renal failure, and as can be judged from the literature, several papers have been published in various international journals devoted to various disciplines, especially lipids, lipid metabolism and lipolytic enzymes during pathophysiological condition like uranyl nitrate induced acute renal failure.

Uranyl nitrate, being widely used in industries, has become a target of several investigators. It has been demonstrated that, these rare earth compounds affect the morphology and ultrastructure of several target organs like kidney and liver in particular. In this regard extensive biochemical data on organs like kidney liver, brain and adipose tissue has been published from our laboratory. This include mainly the behavioural and physical study of the animal after uranyl nitrate administration and possibility of acquisition of tolerance to uranyl nitrate; lipid content of blood after uranyl nitrate administration, behaviour of lipolytic enzymes in kidney, liver and brain in response to uranyl nitrate administration; pathophysiologic response of kidney, liver and brain etc. Especially lipids have been studied in greater details in order to have a definite idea about the lipid interaction during uranyl nitrate induced acute renal failure, A good part of studies have been directed towards understanding

the etiological significance of sequential biochemical alterations that intervene during uranyl nitrate induced acute renal failure. Much of the work in this regard is pertaining to renal tubular necrosis and biochemical alterations in kidney itself.

Despite the various theories and information about the biochemical consequences during uranyl nitrate induced toxicity or acute renal failure, there is no work available on effect of uranyl nitrate on hematology of the animal. Blood being the first and foremost media that is exposed to the toxic compound, the effect of toxin at blood corpuscular level may further help in the diagnostic therapy of uranyl nitrate induced acute renal failure or similar pathophysiological condition in human beings. Few reports available, impart statistical data of the industrial workers exposed to uranium derivatives and the hematological alterations in these workers. However, there is still dearth of information regarding pertinent interpretation of these alterations. To get a clearcut insight about the mechanism of action of uranyl nitrate and the response of various blood corpuscles, a detailed investigation of the hematological alterations during uranyl nitrate induced toxicity is felt inevitable and hence desirable. It is through the present dissertation for the first time that the response of blood corpuscles and blood formed elements to uranyl nitrate is being brought to light. The hematological alterations in response to acute and prolonged toxicity of uranyl nitrate with some biochemical parameters like blood urea

nitrogen and serum lipolytic activity has been reported in the present dissertation along with their probable significance in uranyl nitrate induced toxicity or acute renal failure. To achieve technological perfection both the recent and well established hematological and biochemical techniques have been employed.

The present dissertation is divided into four chapters, with concluding chapter on general discussion. The first chapter gives a detailed and critical account of the existing literature on uranyl nitrate toxicity and effect of uranyl nitrate on blood. It also gives the outline of the plan of the present investigation along with the reasons that led us to the present investigation. The second chapter describes in detail the materials and the hematological and the biochemical techniques employed in the present work. Chapter three describes the effect of different dose concentrations of uranyl nitrate for different time intervals, on the hematological picture of the animal; which includes, determination of clotting time fragility test, Hemoglobin Concentration, ESR, RBC and WBC total count, differential count and the biochemical estimation of blood urea nitrogen and assay of serum tri acyl glycerol hydrolase during acute and prolonged toxicity of uranyl nitrate. The last chapter gives a general discussion and concluding remarks on the observed fact with reference to comparative visualization of biochemical parameters and the probable physiological significance of the hematological alterations in uranyl nitrate induced acute renal failure.

The present investigation opens several avenues for future research in the field of blood corpuscles and blood formed elements during uranyl nitrate induced acute renal failure, Some idea regarding which is given at the end of the chapter on general discussion and concluding remarks.