

## EFFECT OF BIOCHEMICAL ALTERATIONS IN RNA CONTENT OF GILL AND GONAD TISSUES OF *CORBICULA STRIATELLA* DUE TO CISPLATIN TOXICITY

Bhosale P.A. & Dongare V. K.

Department of Zoology

Sundarrao More Arts, Commerce, and Science (Sr.) College, Poladpur.Tal- Poladpur

Dist- Raigad – 402 303,

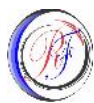
### ABSTRACT

*The biochemical composition of the study in RNA contents of gill and gonad tissues in of corbiculastriatella shows significant decrease in gills from  $2.23 \pm 0.059$  to  $1.98 \pm 0.094$  \*for 15<sup>th</sup> day and on 30<sup>th</sup> day. There is significant decrease from  $1.75 \pm 0.113$  to  $1.41 \pm 0.0896$  \*on Gonad shows significant and decrease from  $8.16 \pm 0.951$  to  $7.16 \pm 0.256$  \*\* on 15th days and on 30<sup>th</sup> days there is a significant decrease from  $7.33 \pm 0.654$  to  $5.80 \pm 0.258$  \*\*.on 30<sup>th</sup> day This is due to toxicity of cisplatin and mobilization of tissue in the metabolism.*

**Key Words** : RNA content , CorbiculaStriatella ,Cisplatin

### INTRODUCTION

The impact of Biochemical alteration of aquatic organisms and their different biochemical processes are useful in determining the mechanism of toxicity and severity of various toxicants and pollutants . Naturally there is a protective mechanism of the body to resist and combat the toxic effect of the pollutant like heavy metals and their derivatives. Besides it is observed that some biochemical alterations occurring in the body give alarming first indication of stress condition .Similarly there are some competitive inhibitors of the normalBiological molecules which are readily mobilized and thus make the synthesised biomolecules inactive. However they have many serious side effects which need to be studied with some biological systems. (Clark et al 2001).Metals are known to decrease the energy level interfering the metabolic pathway (Torreblancaet.al., 1992). Pollutants comprising heavy metals may alter cellular functions, ultimately affecting physiological and biochemical mechanisms of animals(Radhakrishnanet.al.1991). It has been observed that heavy metals can cause biochemical alterations such as inhibition of enzymes, metabolic disorder, genetic damage, hypertension and cancer. (Underwood, 1971; Zemasky, 1974; Lucky and Venugopal, 1977). The nephrotoxicity, ototoxicity and neurotoxicity of cisplatin may be due to reactions with cellular molecules other than RNA. The rate of replicative RNA synthesis was unexpectedly increased and the ribonucleotide pools unbalanced (Skog, et.al., 1994).



## MATERIALS AND METHODS

Attempts will be made in this study to select Freshwater bivalves, *Corbicula striatella* were collected from of Girna dam which is about at the distance of 50 K.M. away from Chalisgaon City of Maharashtra state. First they are made acclimatized to laboratory condition and afterwardly they are washed. The water in the aquarium was changed regularly after every 24 hours. After the acclimatization, bivalves, *corbicula striatella* were divided into two groups with equal numbers of animals They were kept in separate aquarium for 15 and 30 days out of remaining one groups treated by Chronic Concentration LC<sub>50/10</sub> value of 96 hrs.) of Cisplatin (0.836 ppm) On 15<sup>th</sup> and 30<sup>th</sup> day of exposure, bivalves from each experimental group were sacrificed and gills, and gonads, were removed. These tissues were dried in oven at 75 °C to 80 °C till constant weight was obtained and blended into dry powder. These powders were used for the estimation of biochemical components of DNA to observe Efficacy of Cisplatin.

## RESULTS AND DISCUSSION

The above Experiment has concluded that the result obtained on 15 & 30 days of gills and gonads with Cisplatin are as Follows.

### 15 DAYS TREATMENT PERIOD (SUBCHRONIC )

The gill and gonad of *corbicula striatella* shows a significant ( $P < 0.01$ ) decrease. The gill shows control  $2.23 \pm 0.059$  to treated with cisplatin  $1.98 \pm 0.094^*$  mg/g wet tissues in treated. The total RNA content in gill and gonad corresponds to an decrease by 11.21% to 12.25% The profile of total RNA content in gonad shows significant decrease from  $8.16 \pm 0.951$  to  $7.16 \pm 0.256^{**}$  mg/g wet tissues in gonad respectively .The gonad shows a decrease 12.25%. In both cases significantly decreases is recorded.

### 30 DAYS TREATMENT PERIOD (CHRONIC )

The total RNA content of gill and gonad in control *corbicula striatella* has been assessed. The result obtained 30<sup>th</sup> day after treating gills with the dose has shown significant in from  $1.75 \pm 0.113$  to  $1.41 \pm 0.0896^{**}$  mg/g wet tissues. Secondly the result of gonad treated with cisplatin is significant decreases  $7.33 \pm 0.564$  to  $5.80 \pm 0.3460.258^{**}$  mg/g wet tissues respectively .similarly 15 days subchronic exposure of treatment as compare to 30 days

exposure shown that the are both tissues reveals significant depletion in RNA content. In the present comparative study gill and Gonad shows significant elevation in to the RNA level depletion in the exposure periods. This reveals a large variety of chemotherapeutic drugs used to treat cancer, but unfortunately many organic compounds shows limited efficacy problems of delivery and development of Cisplatin is a conventional chemotherapeutic agent that binds co-valently to purine RNA bases and cellular apoptosis. (Kerbel 1997) A better understanding of the downstream cellular targets of cisplatin provides information on its mechanism of action and help to understand the mechanism of drug resistance ( Sivia, Fernandez *et.al.*,2008). Malignant neoplasm including sarcomas. Cisplatin causes cytotoxicity by RNA injury by means of RNA platination (Gately D.P.*et.al.*, (1993)).

**TABLE No.-1 – Alterations in the RNA content mg/100mg dry weight+ S.E. in gill and gonad tissues of corbiculastriatella Treatment with Cisplatin.**

Sr no.	Tissues no.	Days	Control	Experimental	Student 't' test 'p' value	% increases (+) or decreases (-)
1	Gill	15	2.23 ± 0.059	1.98 ± 0.094*	P < 0.01	11.21%
		30	1.75 ± 0.113	1.41 ± 0.0896*	P < 0.01	19.42%
2	Gonad	15	8.16 ± 0.951	7.16 ± 0.256**	P < 0.01	12.25%
		30	7.33 ± 0.654	5.80 ± 0.258 **	P < 0.001	17.50%

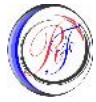
## REFERENCES

**Gately D.P. and Howell S.B. (1993):** Cellular accumulation of the anticancer agent cisplatin. *Clinical Pharmacokinetics*. 20 (3) 216-20.

**Kerbel R.S: (1997):** A cancer therapy resistant to resistance. *Nature* 390: 335-6, 1997.

**Lucky J.D. and Venugopal B. (1977):** Physiology and chemical basis for metal toxicity. *Plenum press*, New York. Pp-238-256.

**Radhakrishnan K., Suresh A., Urmila, Shivarama B. and Krishnan B. (1991):** Effect of mercury on lipid metabolism profiles in the organs of *Cyprinus caprio* (Linn.). *J. Mendal*. 8: 125-135.



**Silvia Fernandez de mattos, PriamVillalonga, Jon clardy and Eric W.F. (2008):** FOXO 3a mediates the cytotoxic effects of cisplatin in colon cancer cells. *Molecular cancer therapeutics* 7, 3237-3246.

**Skog S., Lewin F., HeidenT.andTribukait B. (1994):** DNA synthesis after combined treatment with cisplatin and 5-fluorourasil of amouse as cites tumour growing in vivo. *Anti cancer Drugs* 1994; 5: 83-9.

**Torreblanca A., Ramki J.D. and Diaz Mayans J. (1992):** Changes in biochemical composition of gills, hepatopancrease and muscle of the red cray fish, *Procambarus clarkia* (Girad) after sublethal exposure to mercury., *Comp. Biochem. Physiol.*, 102C, (2): 247-252.

**Underwood E.J. (1971):** Trace element in Human and animal nutrition. 3<sup>rd</sup>. Edn., *Academic press.*, New York.

**Zemansky G.M. (1974):** Removal of trace metal during conventional water treatment. *J. Amer. wat. wks. Assn.*, 66:606