

Effect of Sublethal Concentration of Dimecron on Vitamin C Content in Tissues of *Lamellidens corrianus*

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Fresh water mussel, *Lamellidens corrianus* was exposed to three sublethal concentrations (0.4×10^{-2} , 0.8×10^{-2} and 1.2×10^{-2} %) of Dimecron, an organophosphate insecticide for 24, 48, 72 and 96 h. Changes in vitamin C content were observed after each exposure period. Vitamin C content was observed to decrease in hepatopancreas, gill and foot. Changes in vitamin C content are discussed in relation to exposure period and concentration of Dimecron.

Organophosphate insecticides are toxic to target and non-target organisms like fishes, molluscs etc. (Holden, 1973; Mckim *et al.*, 1976). Very little is known about the effect of insecticide on vitamin content in target and non-target animals (Mukhopadhyay & Dehadrai 1980; Ali & Ilyas 1984). Dimecron an organophosphate insecticide, is widely used in agriculture for pest control operations. Considering the impact of this insecticide on vitamin C content of animals, the present work was undertaken to study the effect of Dimecron on Vitamin C content in various tissues of *L. corrianus*.

Materials and Methods

Fresh water mussels, *Lamellidens corrianus*, of weight 20-25 g (with shell) and length 5-7 cm (with shell) were used. The animals were collected from river Godawari at Nanded. They were acclimatised for eight days in the laboratory. During acclimatisation, fresh water was added after dewatering the tank. After acclimatisation the animals were exposed to different concentrations of Dimecron to determine LC₅₀ value (Litchfield & Willcoxon, 1949). Animals were exposed to three different sublethal concentrations of Dimecron (0.4×10^{-2} , 0.8×10^{-2} and 1.2×10^{-2} %) for 24, 48, 72 and 96 h. After each exposure period vitamin C content in foot, hepatopancreas

and gill muscles were estimated by the modified method of Roe (1957).

The data were analysed statistically by performing student 't' test (Klinchman, 1970).

Results and Discussion

Significant decrease in Vitamin C content in hepatopancreas, foot and gill of *L. corrianus* was observed at all exposure periods and in all concentrations (Tables 1, 2, & 3)

Plants and all animals except pig, man and other primates have the ability to synthesize ascorbic acid. Ascorbic acid is synthesized from glucose (Abraham & Benjamin, 1971). They also observed that administration of hypnotic drugs stimulated the excretion of ascorbic acid in rats. Cyclic ketones stimulate the synthesis and excretion of ascorbic acid in rats (Oser, 1965). Greater requirement of vitamin C is related to detoxification of toxic substances. Mukhopadhyay & Dehadrai (1980) reported lowering of vitamin C content in the liver of Malathion exposed fish, *Clarius batrachus*. Lowering of vitamin C content in the liver of Malathion exposed fish, *Clarius batrachus* could be related to greater requirement of vitamin C during the toxic condition of Malathion. In the present study the results in *L. corrianus* agreed with that of Muk-

Table 1 *Effect of sublethal concentrations of Dimecron on ascorbic acid content in hepatopancreas of fresh water mussel, L. corrianus, after various time periods. (mg ascorbic acid/100 ml homogenate)*

Exposure period, h	Control	Concentrations of Dimecron, %		
		0.4×10^{-2}	0.8×10^{-2}	1.2×10^{-2}
24	0.333 ± 0.03	$0.200^{**} \pm 0.06$	$0.174^{*} \pm 0.05$	$0.165^{**} \pm 0.03$
48	0.254 ± 0.03	$0.182^{**} \pm 0.04$	$0.166^{*} \pm 0.06$	$0.124^{**} \pm 0.03$
72	0.208 ± 0.02	$0.174^{**} \pm 0.01$	$0.165^{*} \pm 0.02$	$0.111^{*} \pm 0.075$
96	0.200 ± 0.02	$0.157^{**} \pm 0.012$	$0.124^{**} \pm 0.012$	$0.102^{**} \pm 0.01$

* Significant, level of significance. $p < 0.0$

** Significant, level of significance. $p < 0.01$

Table 2 *Effect of sublethal concentrations of Dimecron on ascorbic acid content in foot of fresh water mussel, L. corrianus after various time periods (mg ascorbic acid/100 ml of homogenate)*

Exposure periods, h	Control	Concentration of Dimecron, %		
		0.4×10^{-2}	0.8×10^{-2}	1.2×10^{-2}
24	0.341 ± 0.04	$0.225^{**} \pm 0.031$	$0.166^{**} \pm 0.01$	$0.165^{**} \pm 0.05$
48	0.278 ± 0.027	$0.200^{**} \pm 0.02$	$0.166^{**} \pm 0.015$	$0.149^{**} \pm 0.012$
72	0.217	$0.174^{**} \pm 0.03$	$0.124^{**} \pm 0.03$	$0.116^{**} \pm 0.03$
96	0.175 ± 0.02	$0.140^{*} \pm 0.01$	$0.103^{**} \pm 0.01$	$0.094^{**} \pm 0.03$

* Significant, level of significance $p < 0.05$

** Significant, level of significance $p < 0.01$

Table 3 *Effect of sublethal concentrations of Dimecron on ascorbic acid content in gills of fresh water mussel, L. corrianus after various time periods (mg ascorbic acid/100 ml of homogenate)*

Exposure period, h	Control	Concentration of Dimecron, %		
		0.4×10^{-2}	0.8×10^{-2}	1.2×10^{-2}
24	0.242 ± 0.04	$0.200^{**} \pm 0.09$	$0.191^{**} \pm 0.04$	$0.166^{**} \pm 0.05$
48	0.208 ± 0.002	$0.182^{**} \pm 0.011$	$0.165^{**} \pm 0.012$	$0.157^{*} \pm 0.04$
72	0.200 ± 0.04	$0.149^{**} \pm 0.04$	$0.140^{*} \pm 0.004$	$0.140^{*} \pm 0.04$
96	0.157 ± 0.01	$0.116^{**} \pm 0.01$	$106^{**} \pm 0.01$	$0.102^{**} \pm 0.01$

* Significant, level of significance $p < 0.05$

** Significant, level of significance $p < 0.01$

hopadhyay & Dehadrai (1980). Decreased condition of vitamin C content in hepatopancreas, foot and gill of *L. corrianus* may be because of more requirement of vitamin C in toxic condition due to Dimecron. At the same time the biosynthesis of vitamin C might have been reduced as level of glucose in tissues is decreased, (Kulkarni, 1986). Toxic substance stimulates excretion of vitamin C in animals (Oser, 1965) Lowering of vitamin C content in Dimecron treated *L. corrianus* may also be due to the excretion of vitamin C under the toxic stress condition.

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