

Organic Component of Haemolymph in the Male Millipede, *Mordanius importatus* and Effect of Temperature on it

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Abstract:- The present study was undertaken to understand the effect of high temperature as well as low temperature on the haemolymph organic components of the male millipede *M. importatus*. The observations show that exposure of millipedes to high and low temperature affects the haemolymph organic components. After exposure to high temperature the haemolymph total proteins, total carbohydrates and total lipids show gradual decrease. And after exposure to low temperature the concentration of these components show gradual increase.

Keywords:- Millipedes, *Mordanius Importatus*, *Haemolymph*.

I. INTRODUCTION :

The millipedes belong to the class Diplopoda of phylum Arthropoda. The most species-rich group of the Myriopoda is the millipedes, with more than 10,000 described species, classified in at least 15 orders, 144 families (Shelley,2003) and 2,950 genera.

In India, particularly in the western parts, millipedes received less attention as compared to the other Arthropod groups. The present work has been undertaken to study the organic components in haemolymph of millipede *M. importatus*. It helps to understand its taxonomical, economical importance for academic as well as research purpose.

Millipedes are one of the prime decomposers of wood and leaf litter in the tropical region in forest. Thus, they play an important role in soil formation. Millipedes are the common and conspicuous fauna of upper soil and litter layers of tropical, subtropical and temperate forest regions of the world. *M. importatus* is cosmopolitan millipede found abundantly in cotton field during the rainy season (June-October) S. V. Deshmukh (2007) studied the organic components in the haemolymph of the male millipede *Anoplodesmus tanjoricus*.

II. MATERIAL AND METHODS:

The millipede *Mordanius importatus* were collected from the rural area around Amravati city, (Maharashtra, India). All these collected millipedes were kept in glass container with moist soil. For acclimatization millipedes kept in incubator at high temperature (40°C) for 5 days, 10 days and 15 days. Same procedure has been followed for low temperature (12°C). To study organic components of haemolymph, the haemolymph was collected with the help of syringe needle by pricking the head and the drop of haemolymph was collected.

III. OBSERVATION AND RESULTS:

During present study, experiments were carried out for detail investigation of organic components in the haemolymph like total protein, total lipid and total carbohydrate in male millipede, *Mordanius importatus*. The table shows concentration of total protein, total carbohydrate and total lipid in the haemolymph of male millipede *M. importatus* at room temperature and effect of high temperature (40°C) and low temperature (12°C) on it.

IV. DISCUSSION :

In the male millipede *M. importatus*, shows higher level of total protein and total carbohydrates as compared to total lipid. The haemolymph of male millipede *Arthrosphaera lutescens* also shows higher level of total protein and total carbohydrates as compared to total lipid (Sundara Rajulu 1972). Sundara Rajulu (1976) observed remarkable similarity between the insects and the diplopoda as well as in the onychophoran species is the presence of high concentration of total protein. Temperature is one of the important ecological factor to which the living organism must adjust to live successfully in this environment. Millipede can sustain within temperature range from 0°C – 40°C. Temperature plays a major and important role in regulation physiology of millipede. After exposure of millipede *M. importatus* to the high temperature (40°C) for 5 – 15 days, the level of the total protein, total carbohydrates and total lipid was gradual decreases as compared to control (room temperature). And after exposure of millipede *M. importatus* to the low temperature (12°C) for 5 – 15 days,

the level of the total protein, total carbohydrates and total lipid was increases as compared to control.

These observations are in agreement with Deshmukh S. V. (2007) in millipede *A. tanjoricus* and Radha Pant (1979) in insects. The organic components of haemolymph was decrease probably due to decrease in metabolic activity as well as low activities of enzymes.

V. CONCLUSIONS:

After exposure to high temperature, the level of organic components of haemolymph was decreases probably due to decrease in metabolic activity. After exposure to low temperature, the level of organic components of haemolymph was increases probably due to increase in metabolic activity.

Temperature	Sex	Proteins				Carbohydrates				Lipid			
		Control	5 Days	10 Days	15 Days	Contr ol	5 Days	10 Days	15 Days	Contr ol	5 Days	10 Days	15 Days
Low (12°C)	M	1023.83 ± 10.02	784.2 ± 5.658 *	764.6 ± 1.600 *	757.8 ± 1.405 **	755.8 ± 2.564	1007.7 ± 2.458	995.66 ± 1.306*	766 ± 1.316 *	876 ± 1.535	1817 ± 3.243 ***	1002.1 ± 1.516	889.9 ± 0.737 *
High (40°C)	M	1023.83 ± 10.02	1383.83 ± 1.121 **	1172.1 ± 2.287 *	799.7 ± 3.571	755.8 ± 2.564	878.7 ± 2.251	1266.7 ± 1.358*	908.4 ± 1.886	876 ± 1.535	1726. ± 33 ± 1.381	2121.1 ± 2.651* *	1945.3 ± 2.145**

Table 1:- Haemolymph organic component in the millipede *Mordanius importatus* and effect of Low temperature (12°C) as well as high temperature (40°C) on it (values expressed in mg/100 ml). Values are mean ± SE of five individual observations
M – Male

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