

in human females. But there are a number of experimental studies^{3,17}, showing the influence of circulating gonadal hormones on taste intensity and hedonics. Female rats show a strong preference to glucose during proestrus/estrus phase¹⁰. Wade and Zucker⁸ observed that the injection of testosterone decreased the saccharine consumption. Similarly, gonadectomy did not produce change in sweet responsiveness in male rats, but a decrease in glucose consumption was observed in the females³. It is also shown that female rats consumed more glucose solution of higher concentration than males⁴. All these studies tend to suggest the facilitatory influence of estrogen on sweet responsiveness. That the estrogen can also modulate genetically linked taste responses is shown by the shift of PTC taste responsiveness being maximal during ovulatory phase. The gustatory system thus appears labile and related both to the genetic and the environmental (internal and external) determinants.

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ANALYSIS OF CARBOHYDRATES BY HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

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ABSTRACT

High performance liquid chromatography was utilised for the separation of acidic sugar oligomers and partially methylated methyl glucosides.

VARIOUS chromatographic techniques have been in use for the separation of carbohydrates. Paper and column chromatographic techniques are commonly used and are inexpensive; but, they are slow processes and are not suitable for quantitative estimations. Gas-liquid chromatography is very good for quantitative estimations but this technique is applicable only to volatile derivatives. High performance liquid chromatography is an excellent technique, because, this can be used for rapid quantitative estimations, qualitative detections and also for preparative purposes. μ -Bondapak (carbohydrate) column has been used

for the separation of monosaccharides and oligomers from amylose^{1,2}. μ -Bondapak C-18 column has been used for the separation of oligomers in the form of their acetates³. In this communication we report some more applications of high performance liquid chromatography for the separation of acid sugars and partially methylated methyl glucosides in the form of their acetates with the help of bonded type C-18 column.

The individual aldobio-, aldotrio- and aldotetra-uronic acids were acetylated with pyridine and acetic anhydride. The materials were then injected into

TABLE I
Retention Volumes of Different Compounds

Acetates of acidic oligomers		Acetates of partially methylated methyl glucosides		
Compound	Rv *	Comp. No.	Compound	Rv
Glucose	1.00	9	Tetra-O-methyl- α -D-glucoside	1.00
1	1.50	10	Tetra-O-methyl- β -D-glucoside	1.06
2	1.67	11	2,4,6-Tri-O-methyl- α -D-glucoside	1.26
3	1.70	12	2,4,6-Tri-O-methyl- β -D-glucoside	1.42
4	1.30	13	2,3,6-tri-O-methyl- α -D-glucoside	1.22
5	1.35	14	2,3,6-Tri-O-methyl- β -D-glucoside	1.40
6	0.98	15	2,3,4-Tri-O-methyl- α -D-glucoside	1.13
7	1.30	16	2,4,-Di-O-methyl- α -D-glucoside	1.48
8	1.70			

* Rv = retention volume

the HPLC in acetonitrile solution. The compounds analyzed⁴ were 2¹-O-(β -D-glucopyranosyluronic acid) cellobiose (1)*, 6¹-O-(β -D-glucopyranosyluronic acid) cellobiose (2), 6²-O-(β -D-glucopyranosyluronic acid) cellobiose (3), 2-O-(β -D-glucopyranosyluronic acid)-D-glucose (4) and 6-O-(β -D-glucopyranosyluronic acid)-D-glucose (5). All the three aldatriuronic acids have specific retention volumes as shown in Table I and Figure 1. Acid oligomers from xylan namely 2-O-(4-O-methyl- α -D-glucopyranosyluronic acid) xylose (6), 2-O-(4-O-methyl- α -D-glucopyranosyluronic acid) xylobiose (7) and a tetrasaccharide (8) were also separated in the form of their acetates. Retention volumes were calculated with respect to β -D-glucose-pentacetate as unity. The results are shown in Table I.

μ -Bondapak C-18 column was also useful for the separation of the methyl glycosides of partially methylated monosaccharides in the form of their acetates. Tetra-, Tri- and di-O-methylglucosides were nicely separable in acetonitrile-water (3:7) solvent system. It was also possible to get reasonable separation of different isomers of tri-O-methylglucoses. The retention volumes of different compounds were listed in Table I and shown in Figure 2.

EXPERIMENTAL

The liquid chromatograph used was a Waters Associates Model ALC 244 instrument equipped with a Model 6000A solvent delivery system a U6K injector and a Model 401 differential refractive index detector. The detector was connected to an Omini-

Scribe dual channel 10mV recorder. The column used was a 30 cm \times 4 mm I.D. μ -Bondapak C-18 column from Waters Associates.

The solvents used were purified by distillation followed by filtration through millipore filters. Aldobio-, aldotrio- and aldotetrauronic acids were compounds synthesized⁴ or isolated^{6,7} previously. Partially methylated methyl glycosides were prepared by standard methods. The compounds were acetylated with pyridine and acetic anhydride as described before, injected into the instrument and peaks were recorded.

Solvent system used for elution was acetonitrile-water (50:50) for acetates of acidic oligomers. For the separation of the acetates of partially methylated

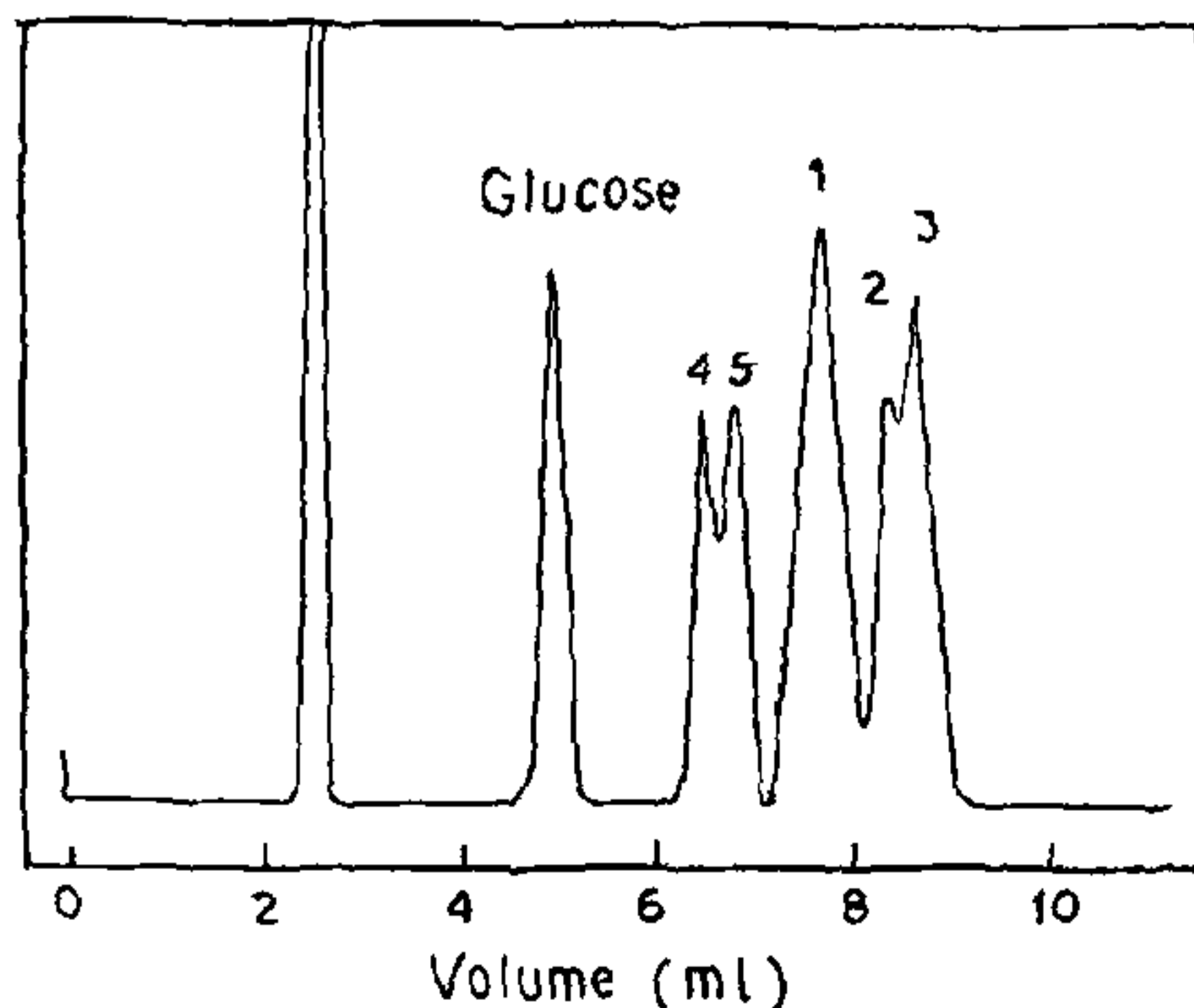


FIG. 1. Separation of acidic oligosaccharides.

* For simplicity aldatriuronic acids are named like this as suggested by Whelan⁵.

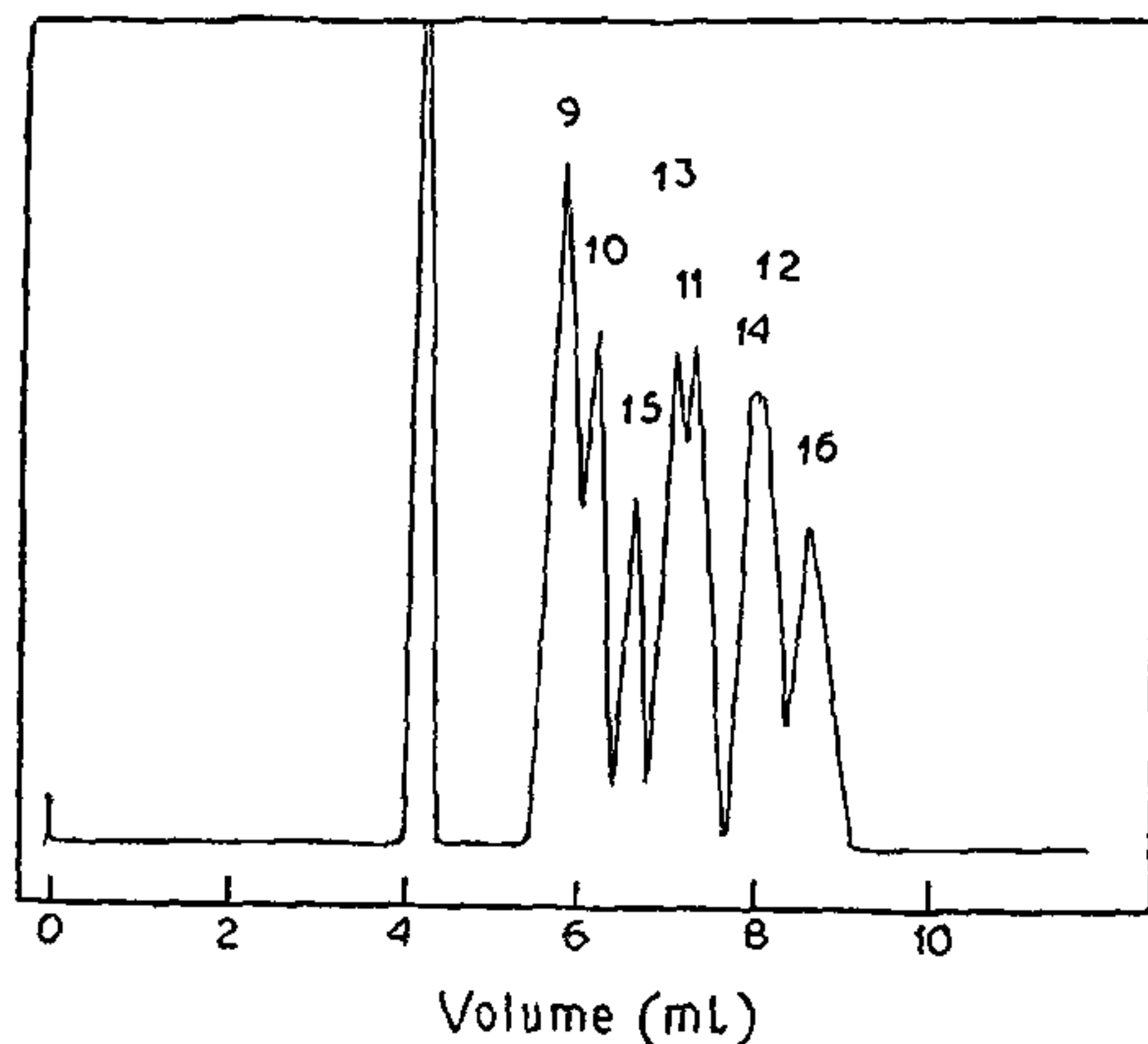


FIG. 2. Separation of partially methylated glucosides.

methyl glucosides the same solvents were used in the ratio 30 : 70. Flow rate in all the experiments was 0.5 ml/min.

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EFFECT OF LETHAL (Lc 50/48 HRS) CONCENTRATION OF METASYSTOX ON SELECTED OXIDATIVE ENZYMES, TISSUE RESPIRATION AND HISTOLOGY OF GILLS OF THE FRESH WATER AIR-BREATHING FISH, *CHANNA STRIATUS* (BLEEKER)

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ABSTRACT

Lethal exposure (Lc 50, 5 mg/litre) of metasystox decreased succinate dehydrogenase activity and tissue respiration, while lactate dehydrogenase activity increased in gill, brain, liver, muscle and kidney tissues. Histological observations indicated extensive damage to gill epithelium, particularly secondary lamellae and chloride secreting cells. Possible reasons for these changes are discussed.

INTRODUCTION

THE mode of action of organophosphorus insecticides has been studied by many workers. Primarily, they appear to inhibit the working of the enzyme cholinesterase and so act on the nervous system^{1,2}. Secondly, they are also responsible for a number of physiological and biochemical disturbances^{16,17}. Recently, several experimental evidences indicate that carbonic anhydrase and adenosine triphosphatase enzymes in channel catfish, *Ictalurus punctatus*³ were severely inhibited following O, O, diethyl O-isopropyl 4-methyl 6-pyrimidyl phosphorothionate intoxication. But unfortunately very little

information is available on the toxic effects of locally used insecticides on economically important fresh water fishes. Metasystox is probably the most widely used insecticide against sucking aphids, spider mites, saw flies etc. It is primarily a neurotoxicant inhibiting the working of the enzyme acetylcholinesterase¹². Metasystox exposure (ME) also inhibited bimodal respiration and some blood parameters in air-breathing fishes¹⁴. The present paper deals with the effect of metasystox on some selected oxidative enzymes, tissue respiration and histology of gills of ubiquitous major fresh water fish, *Channa striatus*. The fish, abundantly available locally, is extensively cultured in ponds and rice-fields and is frequently