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Comparative Analysis of Lipid Metabolism in Some Cestode Parasites of Vertebrate Host from North Maharashtra India

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Abstract:
The present communication deals with lipid metabolism in cestode parasite of vertebrates. Cestodes are incapable of de novo synthesis of nonvolatile saturated and unsaturated fatty acids, and have shown to rely on their hosts to supply fatty acids for lipid biosynthesis. Thus the fatty acids of these worms reflect to varying degrees of host intestinal contents. Lipids are heterogenous group of compounds with similar physical properties, being relatively insoluble in water but soluble in organic solvents. The total lipid content of helminth parasites is in variable, but lipids have a variety of functions from species to species. In the degree of lipid content, variation is also seen in the segments and region of the worms being experimented. In older proglottids the higher content of lipid has led to the view that much of this lipid largely represents waste products of metabolism.

Keywords: Helminth, Parasite, host, lipid, fatty acids.

I. INTRODUCTION

Tapeworms when live in the intestine of hosts, they utilize food from the gastrointestinal tract. The metabolism of these cestodes depends on the feeding habits and the rich nourishment available in the gut of the host. These worms use these nutritional substances for their normal development and growth**.** In tapeworms the synthesis of lipids is only studied in H.diminuta. Lipids are generally divided into simple lipids, comprising the fats (tryglycerol esters of fatty acids) waxes (esters of fatty acids with complex monohydric alcohols) and compound lipids comprising the phospholipids and glycolipids, steroids are also included in it. There is considerable variation in lipids from species to species and the degree of lipid content. Variation is also seen in the segments and regions of the worms being experimented thus total lipid to be somewhat meaningless, unless the degree of maturity is known.

The lipid content of some species grown in different hosts may vary substantially, H. diminuta (Ginger and Fairbrain, 1966 b) from Hammerssten contained 9.5% lipid (dry weight) and those from long evans rate 16.5% (dry weight) warren and Daughtery, 1957). In H.diminuta the lipids tend to be more abundant in the most posterior proglottids (Fairbrain wetherin hharpur and Schiller, 1961).

Figures for total lipids thus tend to somewhat meaningless unless the degree of maturity in known. The higher content of lipid in older proglottids had led to the view that much of this lipid largely represents waste products, of metabolism (Brand T. Von, 1952). Harrington G.W. (1965) worked on the lipid content of Hymenolepis diminuta of H. citelli, Shinde G.B. and Mitra K.B. (1979) worked on the lipid percentage variations according to the seasons of R. (R.) tetragona (Molin, 1858) after South well, 1930.

II. MATERIAL AND METHODS

The intestine dissected and were found to be heavily infected with cestode parasites, these cestodes of various hosts were kept separately and their intestines were also kept separately in previously weighed watch glass.

This material was taken on a blotting paper to remove excess of water and then it was weighed on sensitive balance to obtain in the wet weight of the tissue. Lipids are roughly divided into simple and conjugate lipids, which serve primarily as store of ox disable substance and those, which are part of structural element of the cell. Lipids are soluble in organic solvent and hence we shall use solvent like methanol, chloroform and ether for their estimation, Berner, H. and I.By block stock method, 1973. Reagents –

1) Chloroform methanol

2) Vaniline (2 gms of vaniline dissolved in 200 ml of D.W. and add to it 800 ml of orthophosphoric acid kept in for one month).

3) Stock – 50 mg of Cholesterol in 10 ml. Chloroform methanol 1 ml. Stock dry two days. Add 2ml conc. H_2SO_4, boil it for 10 minutes and cool it for 30 minutes.

Homogenate 100mg. of sample by adding 100 ml.Chloroform methanol (2:1). Take 1ml. of supernatant solution; keep it for dry at 37^0 c.temp. add 1 ml. of conc. H_2SO_4, boil it on water bath, cool it for 30 minutes, take 0.2 ml. solution, 5 ml. of vaniline reagent, wait for 30 minutes, read O.D. on colorimeter at 530 mu filter. Lipid content in cestode parasites and their related hosts are shown in table.

Table.1. Liipd content in cestode parasites and their related hosts

SR. NO.	PARASITES	MG/100MG + OR – S.D.	HOSTS	MG/100MG + OR – S.D.
1	Unicilocularis ranuae, n.sp.	21.24	Trygon zugei	16.91
2	Poypocephalus sakriensis n.sp.	22.22	Trygon sephen	20.07
3	Polypocephalus pandeyae n.sp.	23.04	Trygon walga	21.22
4	Tylocaphalum babulalae n.sp.	20.12	Trygon zugei	15.98
5	Tylocphlum shindei n.sp.	19.74	Trygon sephen	17.37
6	Tetragonocephalum singhii n.sp.	17.63	Trygon sephen	15.03

III. RESULTS

The lipid content of parasite is more as compare to their hosts; lipid level is 21.24 mg./100mg.in Unicibilocularis ranuae n.sp. where as it is 16.91mg./100mg. in its host Trygon zugei. Therefore as compare to host (Trygon zugei) 04.33mg.of lipid content is more in its parasite U.ranuae. Thus in above Table detailed Values are given.

IV. DISCUSSIONS

By the bio-chemical estimation of lipids, we can conclude that the percentage of lipids is more in the parasites, as compare to their related hosts. It seems that the parasite is taking advantage from its host and is thus absorbing most of the nourishing material. The parasite is fulfilling its needs from the host and in a way causing hindrance in the proper development of the host. This high level of lipid may also be because, the parasite often absorbing the lipids, stores for further processes and does not utilize it instantly. In the infection of tapeworms lipid alteration in the parasite tissue commonly occurs but no generalized trend can be given for such alterations. In the present investigation different quantities of lipids are observed by the parasite, probably due to the difference in the amount of unsaturated fatty acids that can be permitted through the membrane system of parasites.

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