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PARASITIC HELMINTHS AND THEIR BIOCHEMICAL AND PHYSIOLOGICAL CHARACTERISTICS

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Abstract:

During evolutionary development, according to the morphological structure of the helminth's body, the father adapted to a parasitic lifestyle, especially to the anaerobic digestion of substances. The biochemical description of adaptation to life as an anaerobic organism is a feature of metabolism and energy in helminths. An increase in the activity of certain enzyme systems in adulthood, rapid growth, development and rapid provision of protein biosynthesis to leave numerous offspring are the main signs of adaptation of helminths to parasitic life.

Keywords: Helminths, larvocysts, microtrichia, cancer chain, anaerobes, mitochondria, ATP synthesis.

Introduction

Purpose of the study: to study the adaptation of helminths to parasitic life and the features of their morphophysiological and biochemical specialization in the host body.

Materials and results of the study:

Fasciola hepatica, Dicrocoelium lanceatum species of the Trematoda class of flatworms have no body head; it is filled with parenchyma tissue cells.The digestive system consists of the mouth opening from the center of the oral cavity, the pharynx, a short esophagus and two large intestines that end in the appendix. Close the rear exhaust port (anal). It feeds primarily on blood, tissue and intercellular juices; digested nutrients are absorbed directly from the intestine into the parenchyma cells. The remains of undigested food are excreted through the mouth. Cestodes are parenchymatous animals that resemble trematodes.

The body consists of the head (scolex), neck and joints, and its surface is a skin covered with microvilli - microtrichia of the internal epithelial tissue of the intestines of highly structured animals. Digestive enzymes are active in them, which belong to the group of hydrolytic phosphatases and take over the function of digesting and absorbing food. In cestodes, the digestive, respiratory and circulatory systems are not sufficiently developed. The host's body

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clings to the villi of the internal part of the host's body through variously developed suckers and loops on the head (scolex) and absorbs ready-made nutrients (monosaccharides, amino acids, fatty acids, glycerol, vitamins, hormones, minerals) salts and other metabolites) through microtrichia covering its body, it feeds because it lives in conditions of oxygen deficiency, and digests them through anaerobic oxidation. (Beneditov I.I., 1982, Urolov M.Yu., 1990, 1991).One of the physiological and biochemical features of helminths that allows them to lead a parasitic life, especially on an intermediate or main host organism, is their infectious (invasive) period - the period of hatching of mobile larvae from eggs (oncospheres) or larval cysts. Invasive periods of parasites entering the host's body through nutrition: from a "quiet" state to an "explosive" period of "development". It is influenced by the temperature of the internal environment of a living organism, enzymes and other bioactive factors.First of all, at a normalized temperature, the concentration of HCO3 ions increases, and the egg (oncosphere) is pushed through the shell of the larval cyst into the internal environment, acting as a special receptor on the receptors of the embryo or helminth larvae.As a result, the biosynthesis of special juices (enzymes) such as chitinase, leucine aminopentidase, esterase begins. In turn, under the action of enzymes, the shell of the worm egg, the cyst (sac) of the infestation larva dissolves, and the infestation larva comes out, settles in the tissues of the internal environment of the host and begins postembryonic or imaginary development, feeding, differentiation and the adult larva (larvocyst) passes into the parasitic helminth stage.This is a biochemical description of the adaptation of an anaerobic organism to life and a feature of the metabolism and energy of helminths. In particular, a sharp increase in carbon-water metabolism, a variety of metabolic end products, an increase in the activity of certain enzyme systems in adulthood, a rapid increase in protein biosynthesis for rapid growth, development and leaving a large number of offspring most important signs of helminth adaptation to parasitic life.Cellular mitochondria, which ensure the biological oxidation of consumed finished nutrients in the "respiratory chain", are found in the cells of all parts of the body of trematodes (e.g. the liverworm Fasciola hepatica) and in other nematodes (e.g. the human roundworm Ascaris lumbricoides) mainly in contractile muscle tissue in large quantities in cells and in cestodes (e.g. human and rat worms - Hymenolepis diminuta) in small quantities in sarcoplasmic muscle fiber cells.Accordingly, in helminths it was found that all the enzymes of the cancer chain are present, but their activity is very low. The conversion of fumarate to succinic acid in the presence of HAD,H is the most important sign of adaptation of helminths to anaerobic conditions due to the activity of the enzyme fumarate reductase in this chain. Therefore, malate (malic acid), formed in the cytoplasm of the parasite, is the substrate of all redox reactions in mitochondria.

Enzymes such as succinate dehydrogenase, alpha-ketoglutorate dehydrogenase, fumarase and isocitrate dehydrogenase are also found in mitochondria. This ensures the formation of amber (succinate), propionate, acetate and lactic acid as end products of metabolism. Only in nematodes is the enzyme lactate dehydrogenase located outside the mitochondria, so only lactic acid is present in its metabolites. ATP synthesis occurs in mitochondria through biochemical changes due to the conversion of fumarate to succinic acid by the flavoprotein system.

Conclusion:

Metabolism in helminths, including a sharp increase in carbon-water metabolism, diversity of final metabolic products, activity of some enzyme systems with periods of adult life, rapid maintenance of protein biosynthesis for rapid growth, development and departure of a large number of offspring - adaptation of helminths to parasitic life.

References:

1. Венчиков А.И. Физиологически активные количества микроэлементов как биотический фактор. //Рига, 2019, стр. 571-575.
2. Назарова Ф.Ш., Маткаримова Г.М. Морфофизиологические и биохимические адаптации гельминтов.
3. Назаров Ш.Н., Риш М.А., Шукуров Д. Использование химического анализа шерсти при крупно-мштабном биогеохимическом районировании и дифференциальном применении микроэломов в животноводстве.//№7.с.32-34.
4. Назаров Ш.Н. Полярографическое определение цинка и растительного сырья. Изд. «Наука», Ташкент, 2009, стр. 179.
5. Риш. М.А., Назаров Ш.Н. Содержание некоторых микроэлементов в шарсти каракульских овец различной окраски. //М. 2013. № 9. С. 49-54.
6. Назарова Ф.Ш., Худойбердиева Г., Джуманова Н.Е. Биохимический сравнительный анализ экологического состава фитонематод.
7. Назапова Ф. Ш., Джуманова Н. Э. Использование бентонита азкамапского мектопойдения для балансировки минепального питания // Академические исследования в области педагогической науки. – 2021. – Вып. 2. - № 9. - С. 672-679.
8. Назапова Ф.К., Джуманова Н.Е. Волоко-шептный покров как индикаторы загрязнения окружающей среды техногенными и геохимическими икточниками // Тематический юпнал микпобиологии. – 2022. – Вып. 6. – №1.
9. Назапова Ф.Ч., Джуманова Н.Е., Ташмаматов Б.Н., Ш. О. Копьявов. Экологическая гпуппиповка фитонематод. Ппоблемы биологии и медицины. - 2020. № 6. Том 124. - С. 258-261.
10. Назапова Ф.Ш., Джуманова Н.Е. Биологическая пол микпоэлементов и іх кодирование в эпидепмальных образованиях. Экономика и объект.1-2(92).2022. ктп. 94-103
11. Худайбердиева Г. А., Назарова Ф. Ш., Джуманова Н. Э. Сравнительный анализ экологического состава фитонематод //Форум молодых учений. – 2021. – нет. 4. - С. 381-385.
12. Джуманова Н.Е., Назарова Ф.С. ВЕРОЯТНОЕ НЕГАТИВНОЕ ВОЗДЕЙСТВИЕ ГЕНЕТИЧЕСКИ МОДИФИЦИРОВАННЫХ ПРОДУКТОВ НА ЗДОРОВЬЕ ЧЕЛОВЕКА //Тематический журнал ботаники. - 2022. - Т. 6. – нет. 1.
13. Назарова Ф.С., Джуманова Н.Е. ВОЛОСЫ И ШЕРСТЬ КАК ИНДИКАТОРЫ ЗАГРЯЗНЕНИЯ ОКРУЖАЮЩЕЙ СРЕДЫ ТЕХНОТЕХНОГЕНИЧЕСКИМ И ГЕОХИМИЧЕСКИМ ИСТОЧНИКАМИ //Тематический журнал микробиологии. - 2022. - Т. 6. – нет. 1.

14. Шариповна Н.Ф. и др. БИОЛОГИЧЕСКАЯ РОЛЬ МИКРОЭЛЕМЕНТОВ И ИХ СОДЕРЖАНИЕ В ЭПИДЕРМАЛЬНЫХ ОБРАЗОВАНИЯХ //Европейский журнал молекулярной и клинической медицины. - 2021. - Т. 8. – нет. 2. - С. 1675-1687.
15. Nazarova F. SH. Kuvondikova R.N. Stem cells and its importanse in medicine. Ethiopian international journal of Multidisciplinary Research.11.11.23. Volume 10,Issue 11.
16. Назарова Ф.Ш. Эпидермальные образования как индикаторы загрязнения окружающей среды техногенными и геохимическими источниками. Innovations in texnologu and science education. SJIF 2023. 5. 305. Volume 2.ISSUE 15. ISSN 2181-317X.