

Biology and Ecology of Blood Plasmodia

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Abstract

This article information about focused on the biology and ecological characteristics of blood plasmodia, which dolizarb is becoming a problem these days. This article provides information about the diseases caused by the proliferation of blood plasmodia. Also, this article can provide information for young researchers and the general public on how to avoid these organisms and the various diseases they cause.

Keywords. Plasmodium, spores, erythrocyte, malaria, merozoite, Anopheles, V. calacarus.

Introduction

Blood plasmodia are blood spores. This is one of the main groups of the Spore class. Hematospores are endoparasites that live at certain stages of their development in the erythrocytes of humans and warm-blooded animals. Blood spores are similar to intracellular parasites of other invertebrates, such as coccidia, and their life cycle takes place in several hosts. An example of this is the malarial Plasmodium, which parasitizes in human blood. The main purpose of covering the above topic is to delve into the study of this area.

Members of the blood spore family are intracellular parasites and are the main parasites of mammals, birds, and reptiles.

The life cycle of blood spores - plasmodium is carried out by changing the host, as well as coccidia. In their life, asexual reproduction occurs by schizogony, gametogony, that is, the formation of gametocytes, transformation into gametes, fertilization and sporogony - the formation of sporozoites. Malarial plasmodia are similar to each other in terms of lifestyle and reproduction, but differ sharply in some morphological features of the life cycle, reproduction rate, course of the disease, and resistance to external environmental influences [1,2].

Plasmodium malaria goes through the following periods as above.

Asexual reproduction is called schizogony.

Sexual reproduction is sporogony.

Schizogony - if a person has malaria, then it occurs in the human body, and sporogony occurs in the body of female mosquitoes of different species - Anopheles.

The three-day life cycle of malarial plasmodium - plasmodium vivax is as follows.

When a *Plasmodium vivax*-infected mosquito sucks human blood, the sporozoites found in the mosquito's salivary glands enter the human blood. Then, circulating in the blood for a certain time, they stop in the tissues of internal organs: the liver, spleen.

In the tissues and cells of these organs, sporozoites feed endosmally and begin to multiply. The sporozoite nucleus enlarges and then divides into several. Depending on the number of nuclei in it, the cytoplasm divides to the same extent and the next generation of the parasite appears - merozoites. Thus, from the foregoing it is clear that the first reproduction of the parasite occurs outside the erythrocytes.

The resulting merozoites enter the erythrocytes and live as parasites. Merozoites are found inside many red blood cells, and their outer shape is ring-shaped. They are mobile, which creates an amoeba-like movement.

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As a result of maturation of microgametocytes, 4-8 microgametes containing nuclear material are formed. These are male cells, the nuclei of macrogametocytes also increase and become macrogametes [2,3].

These micro- and macrogametes form a zygote by fusing in the gastrointestinal tract of the mosquito. The shape of the zygote is oval, sometimes round, mobile; a zygote of this shape is called an ookinete. The ookinete breaks through the wall of the mosquito's stomach and wraps itself in a special skin. This spore cycle lasts 10-14 days.

They do not form pseudopodia and are inactive. The number of merozoites is less than in *P. Vivax*, their number is 8-12. Gametocytes are small. In the body of a fly, sporogony persist for 20 days at a temperature of +20 C. *Plasmodium falciparum* is the causative agent of tropical malaria. These are mainly found in the African continent. Schizogony in the biological cycle lasts 48 hours. The size of merozoites appears quite large, and their number reaches 20. The structure of gametocytes has a unique character, the tips are rounded and crescent-shaped, and the nuclei are large. The process of sporogonia lasts 16-20 days. The eggs of some mites are 60% infected with piroplasmidia, and the infection can pass through the eggs for several generations. Sporozoites accumulate in the salivary glands of mites. Infested grass mites attach to healthy animals and, while sucking their blood, inject sporozoites from their saliva into the blood, which migrate to specific host erythrocytes or cells of the reticuloendothelial system (ptc) and reproduce asexually. It appears, causes disease. Infestation is

maintained in the body of grass mites for a long time, but piroplasmidia in the organism of the intermediate host die quickly. Cattle become infected with piroplasm when they are attacked by piroplasm-infected larvae of a pasture mite called *V. calacaratus*. Piroplasma in the saliva of a tick sucking the blood of an animal enters the blood vessels, immediately enters the erythrocytes and internal parenchymal organs, where it multiplies and spreads throughout the body. Since *Voophylus calcoratus* is a single-host tick that attaches itself to cattle, its larvae that attack cattle turn into lymph in this organism, then become free and a female tick and become infected with piroplasm by sucking blood. Piroplasma bigeminum, transferred to the body of the tick, reproduces sexually and passes to the tick's ovary. Then the female tick, fed up with blood, falls from the body of the animal to the ground and lays eggs. In this case, the tick can lay eggs in cracks and pits in the ground, under certain objects on the ground. Does not lay eggs on flat ground. After a few weeks, piroplasm-infected larvae emerge from these laid eggs, which lay their eggs in cattle and suck their blood, infecting these animals with piroplasmosis [1]. Malaria plasmodia look different in a large drop of blood than in a smear. This is related to their preparation technique. This drop has the property of staining without additional fixation. In a large drop, most of the erythrocytes are dehydrated and disintegrated. Its characteristic feature is that a certain part of schizonts appears in the blood as the remnants of erythrocytes. Its color is light pink in the form of a disk.

The incubation period of malaria is 10-14 days. It should be noted that the incubation period of three-day malaria can be extended up to one year. Malaria is characterized by the release of merozoites from decomposed red blood cells. The onset of the disease is severe, usually in the morning or afternoon, fatigue, exhaustion, a rapid increase in body temperature, severe chills occur. After about 30 minutes for 2 hours, the temperature rises to 40 (C) and above, chills are replaced by intense heat, the patient begins to have a headache. His condition is deteriorating. After a few hours, the temperature begins to drop rapidly and drops to 35-36 (C). After the decrease in body temperature, the whole body is sweaty and relaxed. After treatment, the patient feels depressed and may fall asleep (with 3-day malaria) or after 2 days (with 4-day malaria) with its tropic form, the attack often repeats every day. The number of attacks reaches 10-15. Then it stops. Parasites exist in the blood for parasite carrier.

- In some cases, if treatment is not carried out, after a few weeks or months, strong excitement begins again.
- The patient develops anemia, fatigue, enlargement of the liver and spleen.
- In the debut of tropical malaria, the access temperature does not matter much and remains at the same level for several days.
- People don't die from 3-day or 4-day oval malaria.
- If treatment is not applied for tropical malaria, fatal infections often occur.

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