Plasmodium Encyclopedia Article

Plasmodium

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Contents

Plasmodium Encyclopedia Article.....1

Contents.....2

Plasmodium.....3

Plasmodium

Plasmodium is a genus of **protozoa** that has a life cycle that includes a human host and a mosquito. The genus consists predominantly of four species: *Plasmodium falciparum*, *Plasmodium vivax*, *Plasmodium ovale*, and *Plasmodium malariae*. With the exception of the latter species, *Plasmodium* are **parasites** of humans.

The main disease of concern with *Plasmodium* is **malaria**. This disease has been a problem for humans for millennia. There are still almost 20 million cases of malaria reported each year. The number of people who are actually infected is thought to be upwards of 500 millions people annually. The death toll from malaria is one to two million people each year, mostly in underdeveloped countries. But even in developed countries, malaria can be a problem, especially if mosquito control programs are not vigilant.

The protozoan is spread to humans by the bite of a female Anopheline mosquito. A form of the parasite known as the sporozoite enters the bloodstream and makes its way to the liver. After multiplying in liver cells, the protozoan can penetrate red blood cells, which is a hallmark of the disease malaria. Multiplication occurs in a red blood cell, which ultimately bursts, releasing new forms of the protozoa that can infect neighbouring red blood cells. Such cycles lead to massive destruction of red blood cells.

Malaria can produce a myriad of symptoms, including high fever, generalized aches, tender spleen and liver, jaundice, and, in severe cases, convulsions, failure of the kidneys, shock, and collapse of the circulatory system. The fever tends to be cyclical, reflecting the cyclical pattern of protozoan release from red blood cells followed by a period of protozoan multiplication inside other red blood cells. These cycles can vary from 48 hours with *Plasmodium vivax* to about 72 hours with *Plasmodium malariae*.

Resistance of the protozoa, particularly *Plasmodium falciparum*, to the drugs such as chloroquinine and pyrimethamine that have previously been an effective control was first reported in 1961. Since that time, the occurrence of resistance has increased. A major factor in the development of the resistance is the adaptivity of the protozoan. The genome of the *Plasmodium* is very complex, and genetic alteration to new environmental pressures occurs quickly.