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Review article

Malaria: A Comprehensive Review of the Disease Life Cycle, Symptoms, Types, Treatment, and Herbal Remedies

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ABSTRACT

Malarial is still the very important parasitic disease in the world. Traditional medicines are used to treat malaria on thousands of years and the sources of artemisinin and quinine derivatives with the high levels of drug resistance, the more cost of artemisinin based on combination therapies and spurious antimalarial drugs, traditional medicine is important and sustainable source of malaria is treatment of endemic areas. The discovery and use of natural compounds required for investigation of safety and efficacy previous to release into the market.

By referring to some recent literatures, data were collected about plant used for the treatment of malaria, evaluation of plant extracts for anti-malarial activity, modes of the action of natural antimalarial agents, and recent research on antimalarial plants in Iran and other countries.

Keywords: Malaria, Antimalarial, Natural Products, Plasmodium, Medicinal Plants, Traditional Medicine.

INTRODUCTION

Malaria is the most important parasitic disease globally and attributed to four plasmodium Species:

Plasmodium falciparum

Plasmodium vivax

Plasmodium ovule

Plasmodium malaria

Plasmodium malaria are similar distribution on plasmodium falciparum but occurs lower frequently. Plasmodium vivax predominates in Central America and India. The plasmodium ova leis in frequently found a part of Africa. Plasmodium knowlesiis appear as the relative zoonotic pathogen that is supplying by explorer from endemic areas around the world. The infection canbepotentiallypropagatedthroughtransfusionsbonemarrowtransplantsanduteroacquisition. In agreement with the World Health Organisation (WHO) report published in 2011. Thereare106familiarcountrieswith malaria transmission divide in thetropicaiand and subtropical areas with abundance billion subclinical cases and thousands of deaths registered yearly. The better distressing situation occurs in the African countries that are south of the Sahara with children under5 years old especially bare global to the surveillance systems cannot captures malaria cases and earth occurring in country. Therefore, estimates are obtained by adjusting the number of reported to take into account the estimated part of cases are not reported [1].

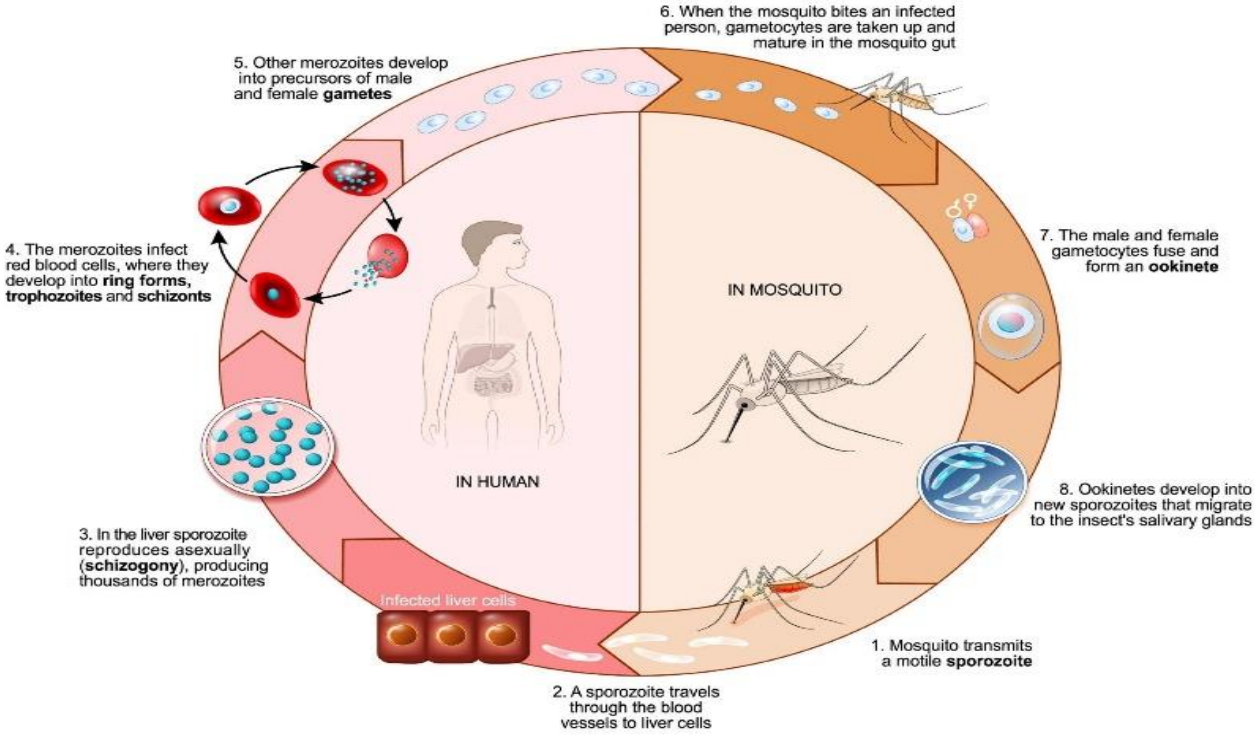
Malaria

Malaria is a disease that causes high fever, chill sand muscle pain. You can get from a bite from an affected mosquito malaria is very rare in the United States most often founding Africa, Southern Asia, Central America and South America. Malaria meal so cause more serious problems. These include damage to the heart, Lungs, Kidney or brain.

Figure 1: Mosquito

Life cycle of malaria disease

Figure 2: Life cycle



Symptoms

Fever is the most common symptom

Chills

Headache

Sweats

Fatigue

Nausea and vomiting

Body aches

Diagnosis

A blood smear test can help diagnose malaria. If the first blood smear doesn't show malaria. A blood test that can diagnose malaria quickly is also available [2].

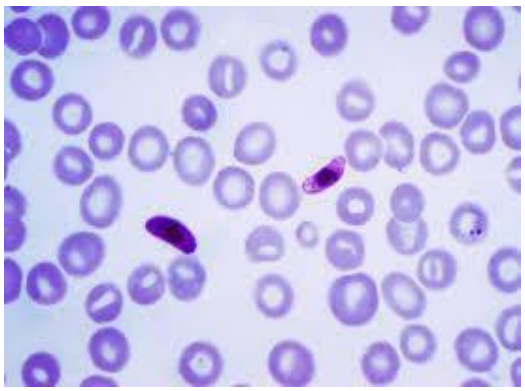
Types of malaria

Plasmodium Falciparum

Plasmodium falciparum is unicellular protozoan parasite of humans and the species of the Plasmodium that cause malaria in human. The parasite is transmit through the bite of female Anopheles mosquito. It has causes the disease more danger from falciparum malaria. It hares possible for 50% malaria cases *plasmodium falciparum* is the dead list parasite n humans. It is associated with development of blood cancer. The species of malaria parasite originate Laveran found in gorillas has 10,000 years ago. Alphonse Laveran is the first to identify the parasite in 1880.The human infective stage are sporozoites formalin vary gland of mosquito. Plasmodium falciparum has 90%of human deaths and deadly brain fever [3].

Diagram of Plasmodium

Figure 3: Plasmodium falciparum



Macro gametocyte (left) and microgametocyte (right) of plasmodium falciparum [4 -7].

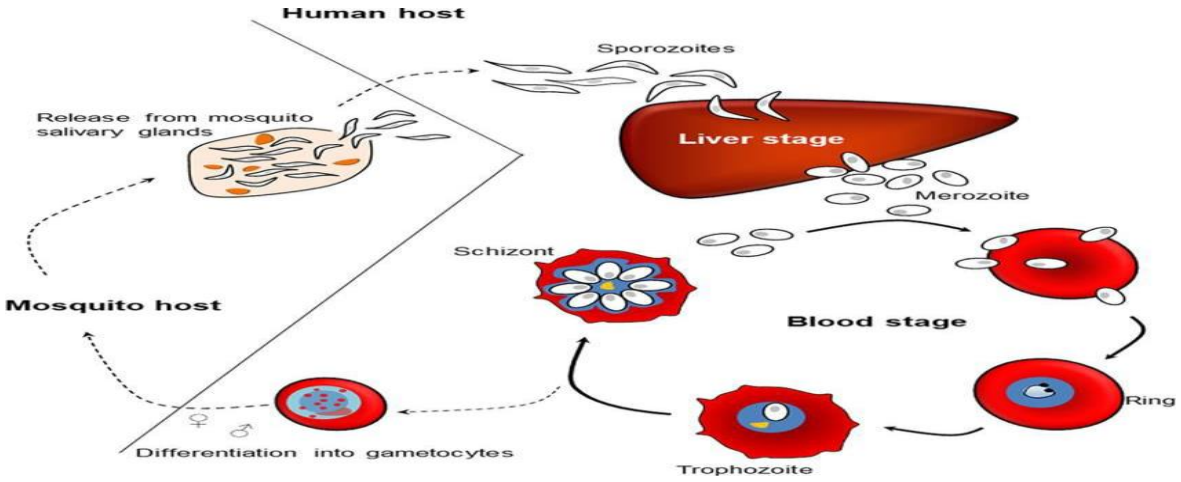
Scientific classification

The apical complex, which is actually combination organelles, is an important structure.

Domain	Eukaryote
Clade	Diaphoretics
Phylum	Aspic complex
class	Aconoidasida
Order	Haem sporida
Family Specie Genus Synonyms	Plasmodiidae Plasmodium falciparum Plasmodium Haem propidium vigesimotertianae

Life cycle of *plasmodium falciparum*

Figure 4: life cycle of plasmodium falciparum



PlasmodiumVivax

Plasmodium vivax is the more widespread of malaria species more than 1-3of the world Population, nearly 2.5billionpeople. It has risk of infection of plasmodium vivax malaria. The high prevalence inlatinAmericaandSoutheastAsia. *Plasmodium vivax* hasoverlapsSignificantlywithplasmodium falciparum in many parts of the world. Plasmodium vivax is the effective cause of malaria infections. *Plasmodium vivax* disease is not depend on age [5].

Diagram

Figure 5: Plasmodium vivax

Scientific classification

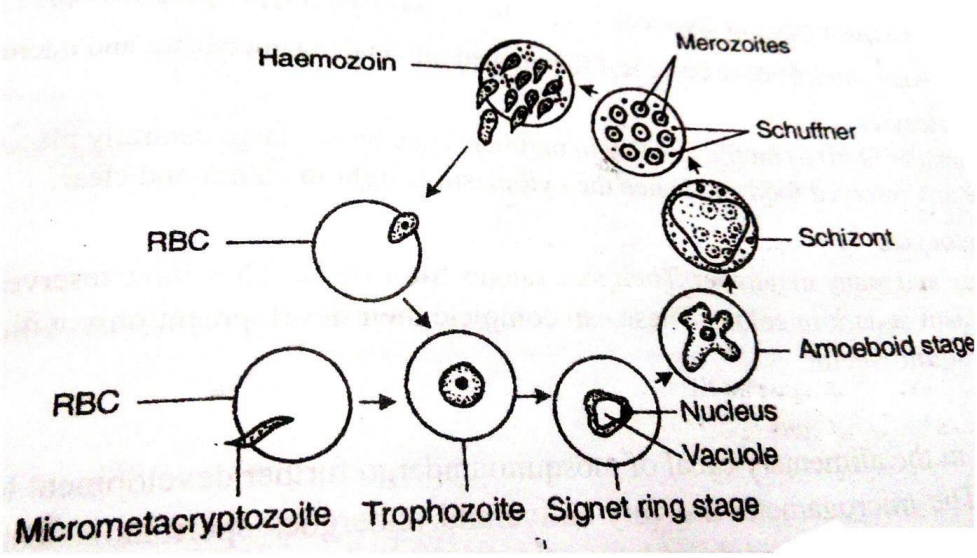
Phylum	Ape complex
Family	Plasmodiidae
Order	Haem spororida
Species	Plasmodium vivax
Class	Aconoidasida
Genus	Plasmodium
Synonyms	Haem sporidiumtertianae
Domain	Eukaryote

Plasmodium ovule

Plasmodium Ovalle is endemic to tropical western Africa Plasmodium Ovalle is non-stages

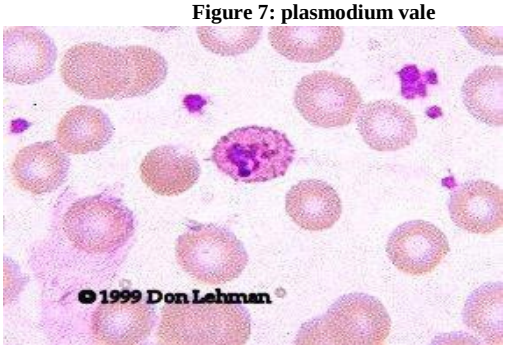
Oliver. Some plasmodium Ovalle schist rupture and release me rozoitesinthecir collation. Plasmodium Ovalle spends about50 horsing erythroid cystic cycle. The sing plasmodium overlies Sporozoites has produce 15,000 daughter merino it seas infected hepato cite. Plasmodium Ova leis infect young red blood cell scales reticulocytes. Plasmodium overlies a species of parasitic protozoon cause tertian malaria in human. Plasmodium ovular in gshaveasturdy cytoplasm mhand big chromatin dots [6].

Figure 6: Plasmodium vivax



Plasmodium Ovalle

Figure 7: plasmodium vale



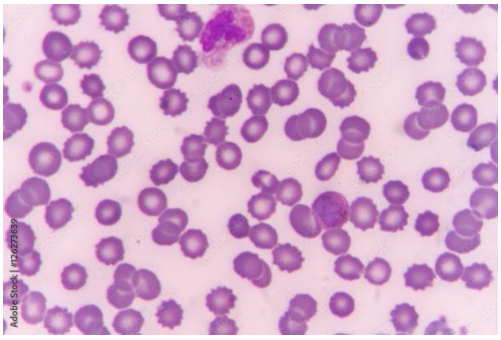
Treatment

Chloe equine and rate is in combination therapy are used to plasmodium Ovalle is malaria disease. Symptoms: Fever, nausea, vomiting, anemia, diarrhea, muscle pain.

Plasmodium Malaria

Plasmodium malaria is a material parasite disease. The discovery by Alphonse laveranin1880. Plasmodium malaria has developmental cycle sinmosquitoandpri mate host. Where, with in parenchymal cell parasite mature inapproximately15days. Plasmodium Malaria to human determine prevalent periods Plasmodium malaria does not relapse for persistently overstate parasites.

Figure 8: Plasmodium malaria



Scientific Classification

Class	Aconoidasida
Order	Haem spororida
Family	Plasmodiidae
Species	Plasmodium lariat
Synonyms	Plasmodium ordain Bump, 1939

Plants used for treatment of malaria

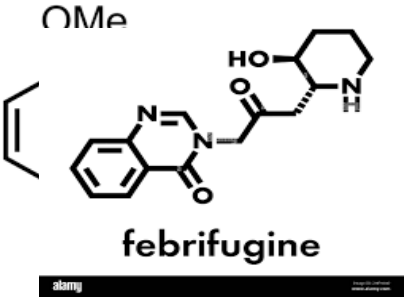
Cinchona

Cinchona species are well known their anti-malaria properties and constituents of alkaloid quinine. The Chinese traditional treatment of malaria include use of Artemisia annual [8, 9].

Scientific Classification

Synonyms	Cinchona bark
Family	Rubiaceae
Biological source	Dried bark of cultivate dress of cinchona Officinal lies.

Drugs used for anti-malaria [10].



CONCLUSION

Thereis an urgent need for development of novel drug to read malaria. Many countries has vast experience in the use of medicinal plants and there quire for the Knowledge spans many countries. Invitro biological tests for detection of anti-malaria activity in plant extract. The biologicalactivitiesofseveralcompoundsisolatedfromspecieso fthesimaroubaceae.

REFERENCES

1. Dannhardt G, Kiefer W, Kramer G S, et al, 2000. The pyrrole moiety as a template for COX-1/COX-2 inhibitors. European Journal of Medicinal Chemistry. 35, Pages-499-510, Doi: 10.1016/S0223-5234(00)00150-1.

2. Bijander K, Vinit R, Arvind K, et al, 2012. Anti-Inflammatory Activity of 1,3,4-Oxadiazole Derivatives Compound. International Journal of Current Pharmaceutical Research. 4, Pages-9-14.

3. Raimondi M V, Cascioferro S, Schillaci D, et al, 2006. Synthesis and Antimicrobial Activity of New Bromine-Rich Pyrrole Derivatives Related to Monodeoxypyoluteorin. European Journal of Medicinal Chemistry. 41, Pages-1439-1445, Doi: 10.1016/ J.EJMECH.2006.07.009.

4. Ashima Gakhar, 2021. Anti-inflammatory perspectives of diverse natural resources. Journal of Medical Pharmceutical & Allied Science. 10(4), Pages-3270 – 3279, Doi: 10.22270/ jmpas.V10I4. 1379.

5. Dodonova J, Uogintaite I, Masevicius V, et al, 2010. PalladiumCatalyzed Reaction of Methyl 5-Amino-4-chloro-2- methylthiopyrrolo[2,3-d]-pyrimidine-6-

carboxylate with Arylboronic Acids. Synthesis of 1,3,4,6- Tetraazadibenzo[cd,f]- azulene Heterocyclic System. Chemistry of Heterocyclic Compounds, 46, Pages-1122-1126, Doi: 10.1007/s10593-010-06 36-5. 9.

6. Courcy B D, Piquemal J, Garbay C, et al, 2010. PalladiumCatalyzed Reaction of Methyl 5-Amino-4-chloro-2- methylthiopyrrolo[2,3-d]-pyrimidine-6-carboxylate with Arylboronic Acids. Synthesis of 1,3,4,6- Tetraazadibenzo[cd,f]- azulene Heterocyclic System. Journal of the American Chemical Society 132, Pages-3312-3320.

7. Kalgutkar A S, Crews B C, Rowlinson S W, et al, 2000. Biochemically Based Design of Cyclooxygenase-2 (COX-2) Inhibitors: Facile Conversion of Nonsteroidal Antiinflammatory Drugs to Potent and Highly Selective COX-2 Inhibitors. Proceedings of the National Academy of Sciences of the United States of America. 97, Pages-925-930.

8. Zarghi A, Ghodsi F S, Dadress O G, et al, 2011. Design, Synthesis and Biological Evaluation of New 5,5-Diarylhydantoin Derivatives as Selective Cyclooxygenase-2 Inhibitors. Scienta Pharmaceutica. 79, Pages-449-460, Doi: 10.3797/scipharm.1104- 20.

9. Etcheverry S B, Barrio D A, Cortizo A M, et al, 2012. Three New Vanadyl (IV) Complexes with Non-Steroidal Anti-Inflammatory Drugs (Ibuprofen, Naproxen and Tolmetin). Bioactivity on Osteoblast-Like Cells in Culture. Journal of Inorganic Biochemistry. 88, Pages-94-100, Doi: 10.1016/S0162-0134(01) 00368-3.

10. 1Fernandes E, Costa D, Toste S A, et al, 2004. The metabolism of sulindac enhances its scavenging activity against reactive oxygen and nitrogen species. Radical Biology and Medicine. 37, Pages1895-1905, Doi: 10.1016/S0891-5849(03)00437-4.