

Title: An *Ovale*-like Malaria Parasite of Man from Central Thailand

Principal Investigators:

MAJ Francis C. Cadigan, Jr.  
Robert Desowitz, Ph.D.

Associate Investigator:

Sanit Puhomcharoen

During the course of a malaria survey of Lopburi Province, Central Thailand an unusual appearing plasmodium was found. The patient was a 22 year old Thai male farmer who complained of fever, chills and headache. After obtaining the blood smears he was treated with chloroquine to which there was a satisfactory response.

Description:

The parasite is unusual in that it exhibits the distortion of the host cell similar to that in *P. ovale*, and the schizonts, although containing a greater number of merozoites, are morphologically like *P. malariae*. However, while the host erythrocyte is stippled it is not as heavy as the Schuffner type, nor is there gross enlargement of the host cell, nor have band form trophozoites been observed.

Trophozoites

The youngest trophozoites seen are unexceptional. The round chromatin dot is prominent and there is a small solid block of well staining cytoplasm. The host cell is unaltered at this stage. Later ring stages occupy 1/3 to 1/2 of the erythrocyte. There is usually a single chromatin dot but double beads and accessory dots are not uncommon. Double infections are rare but present. The rings are regular and show no signs of amoeboidicity. No band forms were seen. Pigment is not discernible at this stage. The host cell is not stippled but may be enlarged and show elongated distortion.

In the slides available there were no forms intermediate between the ring stage and more advanced trophozoite. Because of this, the earliest form in which stippling of the host cell and presence of pigment occurred may not have been observed. The advanced trophozoite in which the vacuole is small or no longer present is irregular in outline but not markedly amoeboid. The cytoplasm stains a bright blue and there are fairly coarse deep gold pigment granules that have a blackish-brown cast. The nucleus is large and often has a distinct dark-staining nucleolus. The host cell stroma has practically disappeared and upon this almost colorless ground there is a distinct fine stippling that is lighter in color than that of the Schuffner type. The infected erythrocyte may or may not be enlarged but the majority show a *P. ovale*-like distortion.

Schizonts

The early schizont shows a tendency for the cytoplasm to round up. It occupies about 2/3 of the red cell. The pigment coalesces into coarse dark granules and at this stage has a tendency to aggregate along the periphery of the parasite. As schizogony advances a large amount of purplish staining material is seen to be interspersed in the blue cytoplasm. The mature schizont is round and rather *P. malariae*-like. It occupies 1/2 to 2/3 of the erythrocyte which is usually enlarged. There is a central mass of dark blackish-brown pigment. There are 12 to 16 merozoites.

Gametocytes

The gametocytes are round and contain numerous rather coarse pigment granules. The mature gametocyte occupies almost the entire host erythrocyte.

### Discussion

Diagnosis of this parasite is difficult. It has been shown to Dr. John W. Field who thought it an aberrant P. vivax and to Dr. R.S. Bray who felt it was an aberrant P. malariae. Field in his book on microscopic diagnosis of malaria (Part 2, 1956) notes that ovale-like vivax has been reported particularly in individuals in chronic or chemotherapeutically partially suppressed infections. As far as can be ascertained our patient had not taken anti-malarials prior to the making of the blood films. Unlike classical P. ovale, the stippling of the host cell is finer and lighter. Also the first appearance of stippling and pigment occurs at a later stage of development than P. ovale. The only simian malaria it might resemble is P. fieldi but does not show the intense heavy eosinophilic stippling of that parasite.

Further surveys are to be carried out in the area to attempt detection of other cases with this parasite. At this time no diagnosis as to species can be given.