

Plasmodium knowlesi

Een "nieuwe" malariasoort uit het Verre Oosten

SKML deelnemersmiddag 6 maart 2008
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Plasmodium knowlesi: aanleiding

Plasmodium knowlesi malaria in humans is widely distributed and potentially life threatening

Cox-Singh et al Clin Infect Dis 2008: 46 165-171

Plasmodium knowlesi : The fifth human malaria parasite

White Clin Infect Dis 2008, editorial

Plasmodium knowlesi: recente literatuur

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Cox-Singh et al Clin Infect Dis 2008, 46: 165-171

A large focus of naturally acquired *Plasmodium knowlesi* infections in human beings

Singh et al Lancet 2004, 363: 1017-1024

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Naturally Acquired *Plasmodium knowlesi* Malaria in Human, Thailand

Jongwutiwes et al Emerg Infect Dis 2004, 10: 2211-3

Plasmodium knowlesi: historie

Knowles R, Das Gupta BM 1932 A study of monkey malaria, and its experimental transmission to man.
treatment neurosyphilis, fatalities, bloodtransmission

Chin et al 1968 Experimental mosquito-transmission of *P knowlesi* to man and monkey

vector: *Anopheles balabacensis* —————> natural vector human malaria in forest SE Asia

forest SE Asia —————> habitat of *Macaca fascicularis*

Macaca fascicularis —————>natural host *P. knowlesi*

→ transmissie mens naar mens !!

Ook: incidentele humane casus

Plasmodium knowlesi: natural host

Langstaart makaak leeft in / langs rand van regenwoud

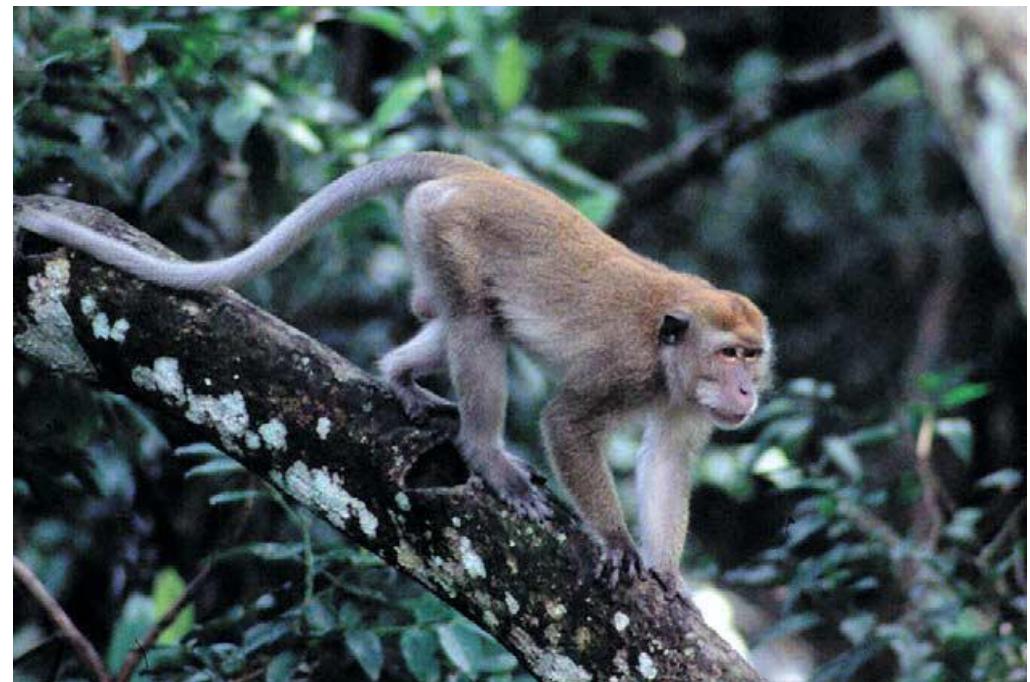


Figure 5: Long tailed macaque (*Macaca fascicularis*)
Singh Lancet 2004

Plasmodium knowlesi: geografie

Maleisië:
Sarawak en Sabah (Borneo)
Pahang (Schiereiland)

Sarawak: Kapit district
90.000 inwoners



Plasmodium knowlesi



Bewoning:
traditionele longhouses, 20-300 personen,
vaak langs rivieren, weinig andere infrastructuur
(Kapit tourist information)

Plasmodium knowlesi



Opkomend toerisme : hotels in vorm van longhouses
(tourist information Kapit, Sarawang)

Plasmodium knowlesi : kliniek / lab

Naturally Acquired *Plasmodium knowlesi* Malaria in Human, Thailand
Jongwutiwes et al Emerg Infect Dis 2004, 10: 2211-3

Casus beschrijving met PCR bevestiging, man, 38 jaar
Transmissie in Zuid Thailand, grensregio Myanmar

T 38,5° C	4 dagen koorts, rillingen, hoofdpijn
Hb 14,0 g/dL	
Ht 0,4	beh: chloroquine
ery 4,2x10e6 / µl	
WBC 5.500 / µl	
thrombo's 90.000 / µl	
parasitemie: 0,03% 1155 / µl	

Plasmodium knowlesi : kliniek / lab

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208 malaria patiënten Kapit district :

106 *P knowlesi* PCR (waarvan 101 *P malariae* microscopie)

0 *P malariae* PCR

Temperatuur	37,9°C (36 - 40)	N=94
ziekdedagen vooraf:	4,5 (1 - 14)	
koorts, rillingen,	100%	
hoofdpijn	32%	
parasitemie	2640 / µl (80 - 117.600)	
behandeling:	chloroquine + primaquine	
parasite clearing:	2,4 dagen (1 - 5)	

Plasmodium knowlesi : kliniek / lab

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960 malaria patiënten van Sarawak:

243 mono-infecties *P knowlesi* PCR (216 *P malariae* microscopie)

23 meng infecties met *P knowlesi* 4 mono-infecties *P malariae*

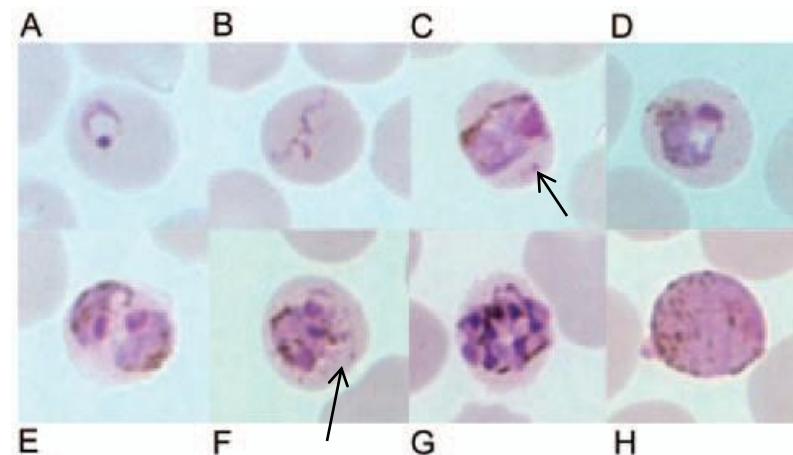
4 fatale *P knowlesi* infecties met zeer hoge parasitemie, lever- en nierfalen

NB: geen geclusterde gevallen ondanks bewoning longhouses

Plasmodium knowlesi : morfologie

Naturally Acquired *Plasmodium knowlesi* Malaria in Human, Thailand
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Figure 1. Giemsa-stained thin blood films depicting
A) ring stage,
B) tenuate form of young trophozoite,
C) band-shaped growing trophozoite,
D) growing trophozoite with little or no amoeboid
activity,



- E) double growing trophozoites,
F) early schizont,
G) late schizont in an erythrocyte with fimbriated margins,
H) mature macrogametocyte.

Discernible **Sinton-Mulligan stippling** is in C, D and F →

Plasmodium knowlesi : morfologie

A large focus of naturally acquired *Plasmodium knowlesi* infections in human beings
Singh et al Lancet 2004

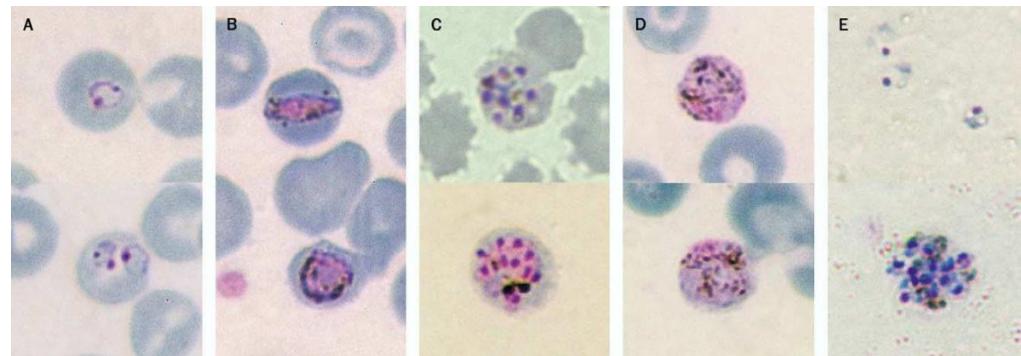


Figure 4: Typical morphology of erythrocytic stages of *P knowlesi* in patients in the Kapit Division of Malaysian Borneo

Giemsa-stained thin (A–D) and thick (E) blood films.

A: early trophozoite or ring form with double chromatin dot (upper panel) and erythrocyte infected with two trophozoites (lower panel).

B: Band form late trophozoite (top panel) and spherical late trophozoite (bottom panel).

C: schizonts.

D: gametocytes.

E: early trophozoites (upper panel) and schizont (lower panel)

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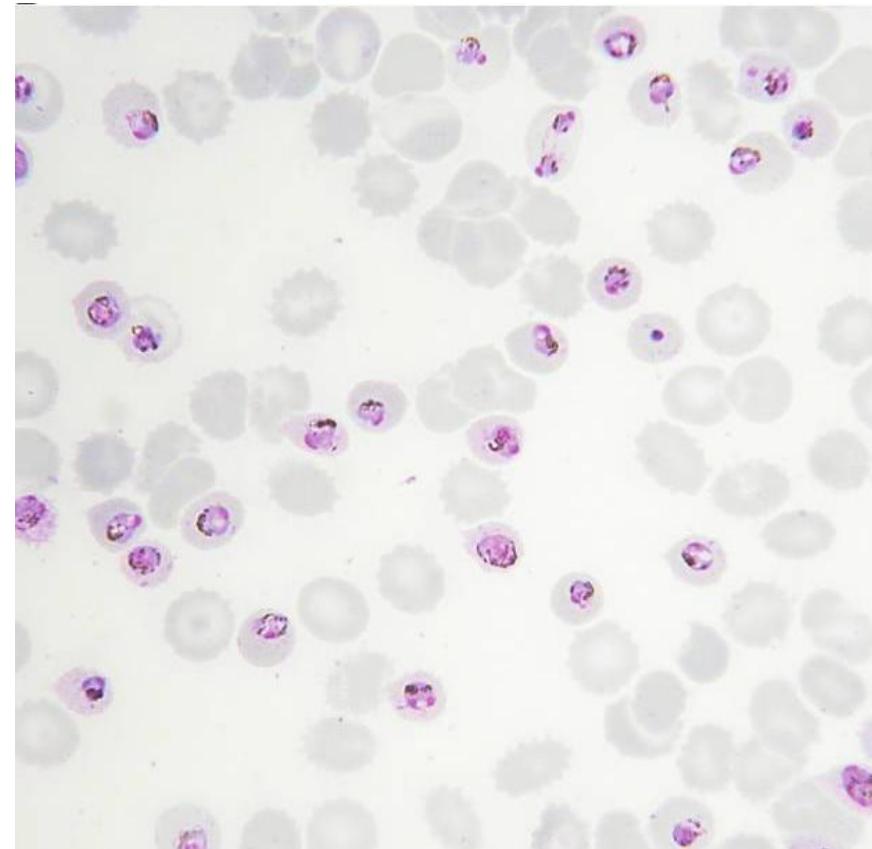
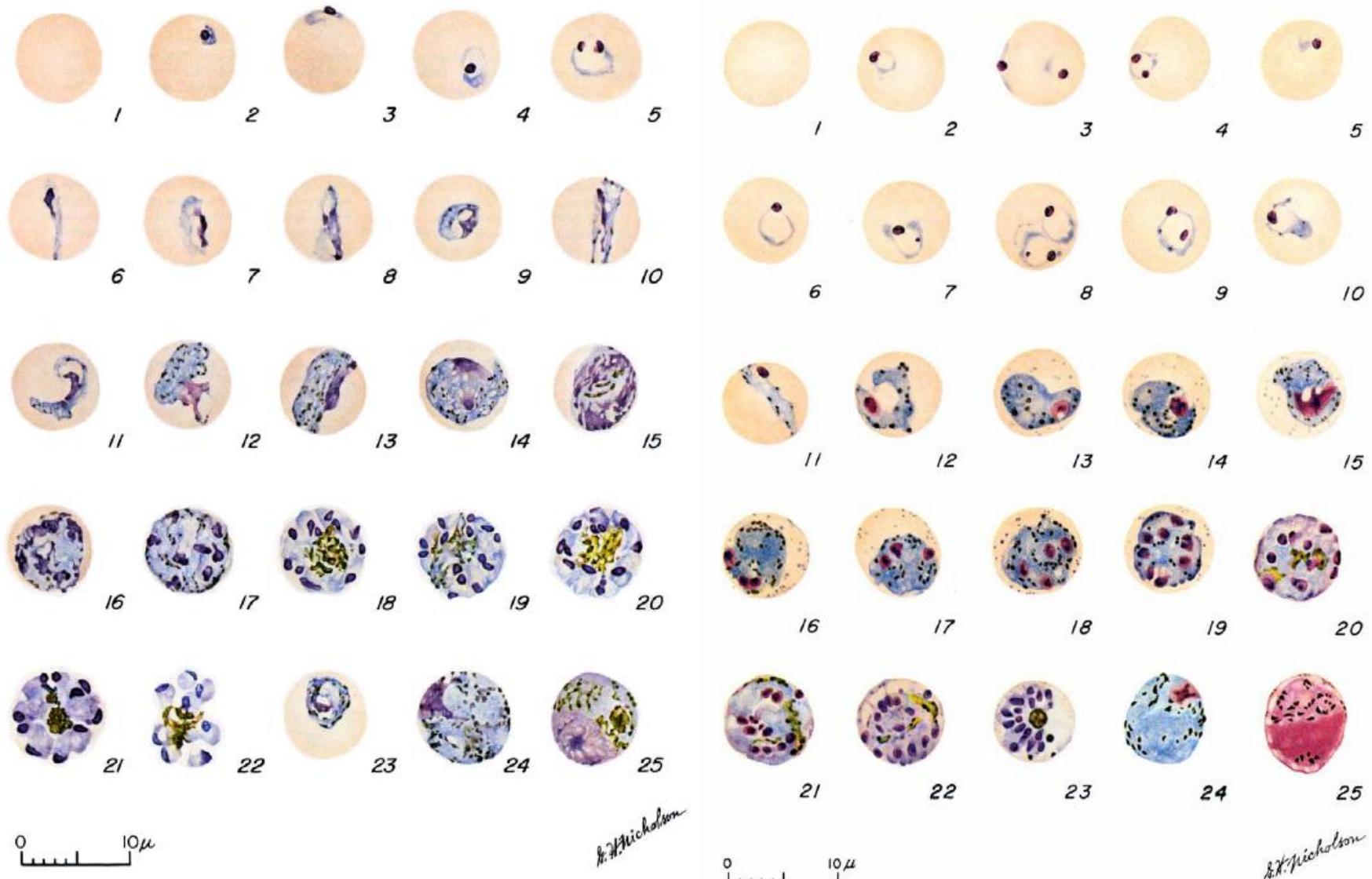


fig 2:hyperparasitemia and a parasite morphology most often confused with
Plasmodium malariae

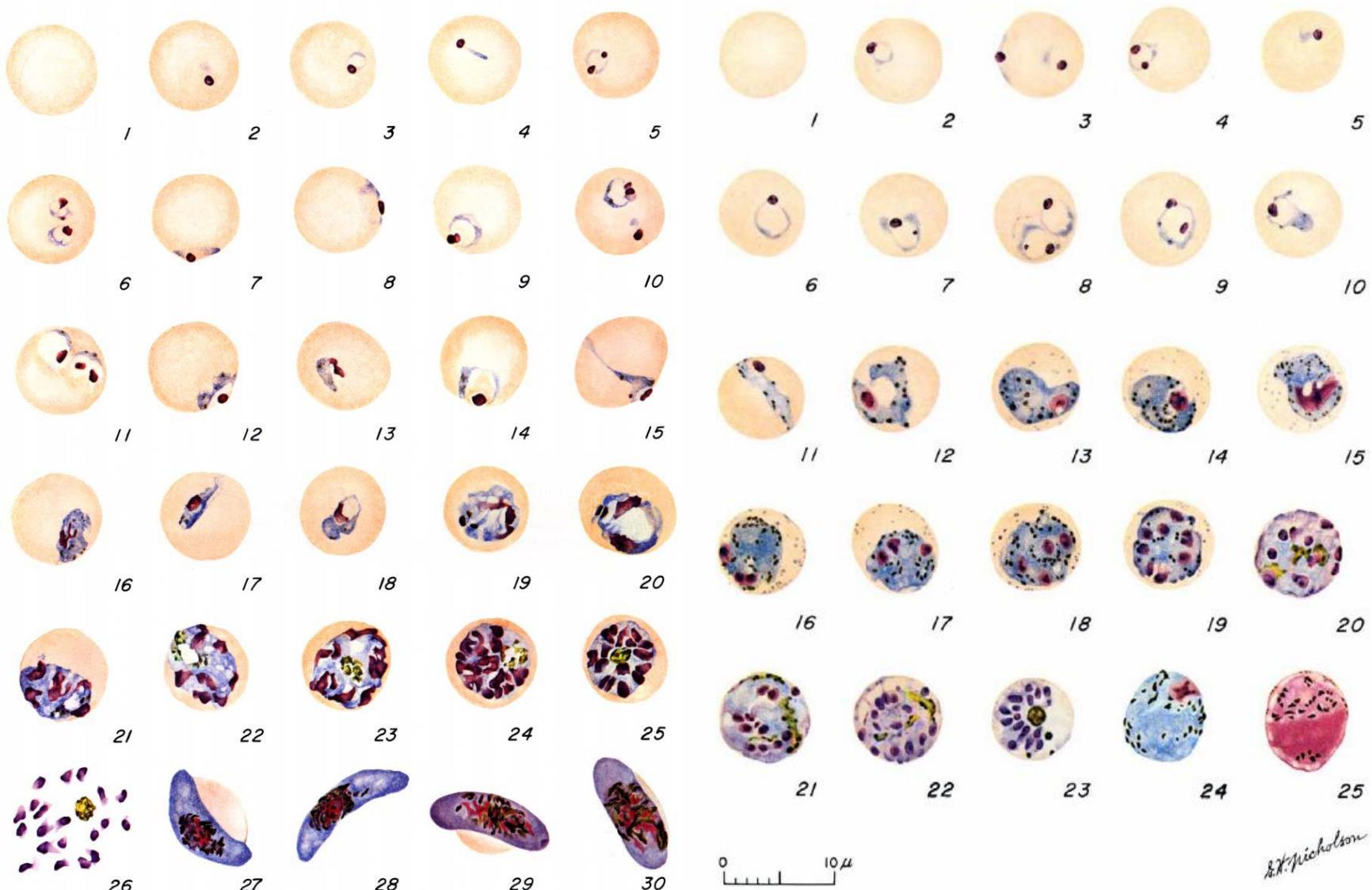
morphology



PLASMODIUM MALARIAE

PLASMODIUM KNOWLESI

morphology



0 10 μ

PLASMODIUM FALCIPARUM

J.H. Nicholson

0 10 μ

PLASMODIUM KNOWLESI

J.H. Nicholson

Plasmodium knowlesi typering

Jonge trofozoïet-stadia :

P knowlesi = P falciparum = P malariae

Oudere stadia:

meestal niet te onderscheiden van P malariae

Hoge parasitemie ontwikkeling : cyclus 24 uur

Alle stadia in perifere bloed

Plasmodium knowlesi : conclusies

- Mens op mens overdracht nog niet bewezen, wel gametocytemie
- Contact met *P knowlesi*/ *M. fascicularis* alleen in regenwoud
- *Anopheles leucosphyrus* familie beperkt tot regenwoud(rand), wat geringe verspreiding kan verklaren
- Mis-diagnose *P knowlesi* heeft geen directe consequentie voor type behandeling: chloroquine gevoelig
- Snel hoog oplopende parasitemie vereist aandacht
- Alertheid bij *P malariae* infecties uit Maleisië, Thailand, Myanmar