

Plasmodium ovale Infections in the Philippines

by W. ALVES, *WHO Epidemiologist, Malaria Eradication Programme, Manila, Philippines*,
L. A. SCHINAZI, *WHO Parasitologist, Malaria Eradication Training Centre, Manila, Philippines*,
and F. ANICETO, *Malariologist, Philippine Malaria Eradication Service*

Garcia ^a described and illustrated a parasite, which he took to be *Plasmodium ovale*, in the blood of a Filipino boy, aged 11, living in Manila; while it is not clearly stated, it is implied that the infection was contracted in the Philippines. In 1949, a malaria parasite was isolated from Dr Alan W. Donaldson, United States Public Health Service, on his return to America. Dr Donaldson had served in the Second World War in the West Pacific area, in the Admiralty Islands and the Philippines, and Jeffery, et al. ^b believed that the infection was most probably contracted on the island of Luzon in the Philippines. After further studies it was finally concluded ^c that this "Donaldson strain" was indeed *P. ovale*. It is apposite to note also Craig's ^d claim regarding a parasite seen in 1900, from a soldier who had served in the Philippines, which he called *P. vivax* var., and which he later named as *P. vivax minutum*. He was later convinced that the parasite was identical with *P. ovale*. Other references to this parasite in the Philippines have not been found, and this brief note places on record the finding of 2 indigenous cases.

In February 1967, a request for assistance was received by the Malaria Eradication Service, from the Government Bureau of Prisons. It was stated that there were some 1000 malaria cases in a penal colony on the island of Palawan. Two of the authors (W. A. and F. A.) went immediately to Palawan where it soon became clear that the report was based on a misunderstanding. Nevertheless, it was also clear that there were many cases of malaria in the colony and a mass blood survey, accompanied by a mass drug administration, was carried out.

Each man examined was given 3 tablets of Camo-prim, a proprietary preparation containing 450 mg (base) of amodiaquine and 45 mg of primaquine, at the time blood was taken, and a sufficient quan-

tity of the drug was left with the Prisons Medical Officer to treat all inmates with the same regime. As the whole island of Palawan was, and is, in the attack phase, of the Malaria Eradication Programme, it was not considered practicable to attempt any more thorough treatment at the time.

As facilities were limited at the local laboratory of the Malaria Eradication Service, only 91 blood slides were examined there and the remaining 253 slides were taken back to Manila for examination. The results are shown in Table 1.

It is not intended to discuss the epidemiology of the infections at any length, but it should be noted that 75 of the 344 smears were taken from "fever cases". They yielded 40 positives, which is slightly below the total average.

The ovale cases

After the 2 cases of *P. ovale* infection shown in Table 1 were diagnosed, a request was made to the Malaria Unit at Puerto Princesa in April 1967 to obtain personal histories of the 2 patients, and to take blood films from them at monthly intervals. The histories of the 2 patients are as follows.

(1) M. T.; born September 18, 1908 in Uday, Bohol Island; no history of ever having left the Philippines; has been in Iwahig Penal Colony Palawan for the past 5 consecutive years; had an attack of fever in September 1966 (had no complaint of fever at time of survey in February 1967).

(2) K. A.; born January, 1932 in Manang, Hindahan, Sulu; no history of ever having left the Philippines; has been in Penal Colony for more than 2 years; was one of the fever cases seen in the February survey, no fever since (no more treatment was given).

Blood slides from both patients were sent to Professor P. C. C. Garnham, F.R.S., London School of Hygiene and Tropical Medicine, who was kind enough to confirm the diagnosis of *P. ovale* (personal communication).

Only 3 sets of follow-up films were received from Palawan, in April, May, and June, and apart from a light infection with *P. falciparum* in one of the

^a Garcia E. Y. (1941) *Acta med. philipp.*, 2, 341.

^b Jeffery, G. M. Young, M. D. & Wilcox A. (1954) *Amer. J. trop. Med. Hyg.*, 3, 628.

^c Jeffery, G. M., & Young, M. D. (1954) *Amer. J. trop. Med. Hyg.*, 3, 660.

^d Faust, E. C. & Russell, P. F. (1957) *Craig & Faust's clinical parasitology*, Philadelphia, Lea & Febiger, 6th ed., p. 263.

TABLE 1
RESULTS OF MASS BLOOD SURVEY, FEBRUARY 1967

Total examined	Positive		Negative		<i>P. falciparum</i>		<i>P. vivax</i>		<i>P. ovale</i>		Mixed <i>P. vivax</i> + <i>P. falciparum</i>	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
	344	192	55.9	152	44.1	110	57.3	74	38.5	2	1	6

TABLE 2
RESULTS OF MASS BLOOD SURVEY, OCTOBER 1967

Total examined	Positive		Negative		<i>P. falciparum</i>		<i>P. vivax</i>		Mixed <i>P. vivax</i> + <i>P. falciparum</i>	
	No.	%	No.	%	No.	%	No.	%	No.	%
	399	155	45.7	184	54.3	144	73.6	27	17.4	14

April films, nothing of note was found. In October, one of us (F. A.) again visited Palawan and another mass blood survey was made which included re-examination of the 2 *P. ovale* cases; they were both negative. No other cases of *P. ovale* were found. The results are shown in Table 2.

It is perhaps of passing interest to note (1) the change in the *falciparum* to *vivax* ratio, and (2) that many of the *vivax* infections were light in the second survey. Further surveys are being made in an attempt to find more cases, so that a study of the epidemiology of *P. ovale* in the Philippines may be instituted.

Discussion

The 2 *ovale* infections described here were found in Filipino adult males and it seems certain that their infections were contracted in the Philippines, quite possibly in Palawan. M. T. has been in the penal colony for 5 years, and his native province, Bohol, has been considered as non-malarious for many years. K. A. comes from Sulu, where malaria imported from Indonesia or East Malaysia might well be seen, but he had been in Palawan for more than 2 years. Neither of the patients had been outside the Philippine Islands. The infection reported by Garcia^a was also in a native-born Filipino, aged 11, from Leyte, and it seems reasonable to assume that he also had not left the Philippines.

The "Donaldson" *P. ovale* is not in the same category. *P. ovale* has been reported from New

Guinea^e and the Admiralty Islands (Manus) are relatively near to the New Guinea mainland. Since Donaldson stayed in both the Admiralty Islands and the Philippines in the course of his duties, and received heavy suppressive doses of mepacrine, the origin of his infection (which was undoubtedly *P. ovale*) may be open to question.

The case reported by Craig^d was found in a soldier returning from the Philippines who exhibited symptoms of tertian malaria although Jeffery & Young^c state that this patient was a sailor who had just come from the Philippines. However, this case may properly be considered to be a *P. ovale* infection wherever it was contracted.

Lysenko & Beljaev^f speculate that race may play a part in susceptibility to *P. ovale*. It may be of interest to note that one of the cases now presented (K. A.) is in a muslim, possibly of a purer Malay stock than the other patient, who is a typical Filipino from the Visayan region and a probable mixture of Malay, Chinese, and other stock, although it is to be noted that his family name is reminiscent of Northern Luzon (Ilocano), where the Negrito peoples live.

^e Jackson A. V. (1946) *Med. J. Aust.*, 2, 278.

^f Lysenko A. J. & Beljaev, A. E. (1966) *Areas of distribution of Plasmodium ovale and its characteristics* (unpublished working document WHO/Mal/66.577). A limited number of copies of this document are available to persons officially or professionally interested on request to Distribution and Sales, World Health Organization, 1211 Geneva, Switzerland.

Transliteration from Cyrillic characters

The "International System for the Transliteration of Cyrillic Characters", set out in Recommendation ISO/R9-1954 (E) of the International Organization for Standardization, is normally used in the *Bulletin of the World Health Organization* for personal names, titles of publications, etc. However, papers accepted for publication may contain names transliterated differently, and if the original Cyrillic spelling is not recognizable inconsistencies may occur.

For convenience the transliteration from Russian according to ISO/R9 is given below:

Translittération des Caractères cyrilliques

Le « Système international pour la translittération des caractères cyrilliques » présenté dans la Recommandation ISO/R9-1954 (F) de l'Organisation internationale de Normalisation est généralement utilisé dans le *Bulletin de l'Organisation mondiale de la Santé* pour les noms de personnes, les titres de publications, etc. Cependant des articles acceptés pour publication peuvent contenir des noms translittérés différemment et si l'orthographe cyrillique originale n'est pas reconnaissable un manque d'uniformité peut s'ensuivre.

A toutes fins utiles, la translittération du russe selon la recommandation ISO/R9 est indiquée ci-après:

Cyrillic character Caractère cyrillique	Transliteration from Russian Translittération du russe	Examples and remarks Exemples et observations	Cyrillic character Caractère cyrillique	Transliteration from Russian Translittération du russe	Examples and remarks Exemples et observations
А, а	a	Адрес = Adres	У, у	u	Утро = Utro
Б, б	b	Баба = Baba	Ф, ф	f	Физика = Fizika
В, в	v	Вы = Vy	Х, х	h	Химический = Himičeskij
Г, г	g	Глава = Glava	Ц, ц	c	Центральный = Central'nyj
		Голова = Golova	Ч, ч	č	Часы = Časy
Д, д	d	Да = Da	Ш, ш	š	Школа = Škola
Е, е (ё) ¹	e (ë)	Ещё = Eščë	Щ, щ	šč	Щека = Ščeka
Ж, ж	ž	Журнал = Žurnal	(medial, médial)	"or" "ou"	In modern Russian, where ' sometimes replaces medial ъ, transliteration is still ". En russe moderne, où le ' remplace quelquefois le ъ médial, la translittération reste ".
З, з	z	Звезда = Zvezda			
И, и	i	Или = Ili			
Й, й	j	-ый, -ий, -ой = -yj, -ij, -oj			
К, к	k	Как = Kak			
Л, л	l	Любить = Ljubit'	(final)	(Not transliterated. Non translittéré.)	
М, м	m	Муж = Muž			
Н, н	n	Нижний = Nižnij			
О, о	o	Общество = Obščestvo			
П, п	p	Первый = Pervyj			
Р, р	r	Рыба = Ryba	Ы, ы	y	Был = Byl
С, с	s	Сестра = Sestra	Ь, ь	'or' 'ou'	Маленький = Malen'kij
Т, т	t	Товарищ = Tovarišč	Э, э	ë	Это = Èto
			Ю, ю	ju	Южный = Južnyj
			Я, я	ja	Яйцо = Jajco

¹ Cyrillic ё to be transliterated by ë only when the diacritical appears in the original. Le ё cyrillique ne doit être translittéré par ë que lorsque la diacritique apparaît dans l'original.