

1-1-1982

Rural Self-Medication in Malarial Infection(การใ้ยาชุดรักษามาลาเรีย ของชาวชนบท)

Chanpen Wiwat

Weena Silapa-archa

Rungrawee Temsirilerkkul

Juwadee Chiowatana

Follow this and additional works at: <https://digital.car.chula.ac.th/tjps>



Part of the [Pharmacology Commons](#)

Recommended Citation

Wiwat, Chanpen; Silapa-archa, Weena; Temsirilerkkul, Rungrawee; and Chiowatana, Juwadee (1982) "Rural Self-Medication in Malarial Infection(การใ้ยาชุดรักษามาลาเรียของชาวชนบท)," *The Thai Journal of Pharmaceutical Sciences*: Vol. 7: Iss. 3, Article 2.

Available at: <https://digital.car.chula.ac.th/tjps/vol7/iss3/2>

This Article is brought to you for free and open access by the Chulalongkorn Journal Online (CUJO) at Chula Digital Collections. It has been accepted for inclusion in The Thai Journal of Pharmaceutical Sciences by an authorized editor of Chula Digital Collections. For more information, please contact ChulaDC@car.chula.ac.th.

6701258x



ฉบับพิเศษ 133

ORIGINAL ARTICLE

การใช้ยาชุดรักษามาลาเรียของชาวชนบท

จันทร์เพ็ญ วิวัฒน์* วท.ม. (จุลชีววิทยา)

วิณา ศิลปอาษา* M. Phil.

รุ่งระวี เต็มศิริฤกษ์กุล* ภ.บ.

ยุวดี เชี่ยววัฒนา** M.S. (Anal. Chem.)

บทคัดย่อ

จากการสำรวจการใช้ยารักษามาลาเรียของประชาชนในอำเภอไทรโยค จังหวัดกาญจนบุรี พบว่ามีการใช้ยาชุดมากถึง 75.8 เปอร์เซ็นต์ ยาชุดเหล่านี้ซื้อจากร้านขายยาและร้านชำ ผลการวิเคราะห์ยาชุด 193 ตัวอย่าง พบว่ามีเพียง 65.3 เปอร์เซ็นต์เท่านั้นที่มียารักษามาลาเรียร่วมด้วย สำหรับยารักษามาลาเรียที่พบได้แก่ คลอโรควิน เมปากรีน ไพรมาควิน อะโมไดอะควิน และซัลฟาไดออกซิน ร่วมกับไพริเมธามีน ซึ่งอาจให้ร่วมกับยากลุ่มอื่นๆ ได้แก่ ยาแก้ปวด-ลดไข้ สเตียรอยด์ วิตามิน ยาแก้ลมประสาธ และยาด้านจุลชีพ (คลอแรมเฟนิคอล เตตราไซคลิน และซัลโฟนาไมด์)

* คณะเภสัชศาสตร์ มหาวิทยาลัยมหิดล

** คณะวิทยาศาสตร์ มหาวิทยาลัยมหิดล

Rural Self-Medication in Malarial Infection

*Assist. Prof. Chanpen Wiwat B.Sc. (med. Tech.),
M.S. (Microbiology)*

*Assist. Prof. Weena Silapa-archa B. Sc. in
Pharm. M. Phil.*

*Rungrawee Temsirilerkkul B.Sc. in Pharm.
Juwadee Chiowatana B.Sc., M.S. (Anal. Chem)*

Abstract

The investigation of drugs used for the treatment of malaria by the patients in the villages of Sai-Yok District shows that 75.8% of those patients bought drug under the name of "Ya-Chud" from drug-stores and groceries (Ran-Cham). The study of 193 samples of Ya-Chud found that only 65.3% of all Ya-Chud composed of antimalarial drugs, i.e., chloroquine, mepacrine, primaquine, amodiaquine and sulphadoxine plus pyrimethamine. The drugs were dispensed solely or together with other groups of drugs, such as, analgesics-antipyretics, steroids, vitamins, tranquilizers and antimicrobial agents (chloramphenicol, tetracyclines and sulphonamides).

Introduction

The endemic malarial infection in Thailand is mostly caused by *Plasmodium* (*P. falciparum* and *P. vivax*, 70% and 30%, respectively).¹ Drugs frequently used for malarial therapy are quinine, chloroquine, amodiaquine and tetracyclines. Mepacrine is now obsolete for this purpose because of its high toxicity. Tetracycline is usually combined with quinine to achieve the gametocidal activity in the treatment of the infection caused by *P. falciparum*. Primaquine is prescribed as a causal prophylactic, the drug kills sporozoites before they can infect reticuloendothelium cells².

Because of the insufficient governmental health care facilities and the low income of the people in upcountry. People help themselves when the illness attacks by using Ya-Chud (several drugs collected in a plastic bag) bought from the grocery in the village (Ran-Cham). The illness seemed somewhat relieved but mostly chronically attacked as it could be seen from the steadily increasing number of the patients³.

Most of Ya-Chud for malarial infection composed of unnecessary drugs such as analgesics-antipyretics, antihistamines, vitamins, steroids and tranquilizers. Steroids are almost always found in Ya-Chud. These drugs are dangerous as it is

an immunosuppressive agent, thus causing easily being infected and masking the higher degree of malarial infection⁴. In as much as the efficacy of drugs in prevention and treatment of malarial is related to the species of infecting parasite and its stage of development. The proper administration of drugs and the appropriate duration of the treatment are necessary for the successful treatment.

Self-medication with Ya-Chud results not only the treatment failure and drug toxicity but also the drug resistance. Generally, *P. falciparum* easily resists to chloroquine if the insufficient dose of the drug and the inappropriate duration of the medication are taken⁵. Thus the difficulty in managing malarial infection has occurred.

Methods and Materials

1. The sampling of the population

1.1 Ya-Chud were sampling from the groceries in Sai-Yok District, Kanchanaburi Province, during the months of July 1980 to January 1981. The information about Ya-Chud and other related data were collected from the clerks.

1.2 The patients were sampling from seven Tambol (36 villages) in Sai-York District. There were 5,655 families and most of them were farmers. The ratio of the incidence to no incidence of malarial attacked among the family members were 1 : 3 or 1 : 4. The patient may be the husband, the wife or those who were older than 18 years of age.

2. The drug analysis

2.1 Classification of the drugs in Ya-Chud were classified according to shapes, sizes, colours, odours and tastes, compared to the authentic drugs.

2.2 Colour tests

The classified drugs (2.1) were powdered and extracted either with alcohol, chloroform or water. The extracts were divided into portions and the following colour tests⁶ were proceed.

2.2.1 Sulphuric acid test

2.2.2 Nitric acid test

2.2.3 Hydrochloric acid test

2.2.4 Ferric chloride test

2.2.5 Marquis's test (Marquis reagent composed of two drops of formaldehyde and one millilitres of sulphuric acid).

2.2.6 Frohde's test (Apply 1-2 drops of 0.5% aqueous ammonium molybdate solution to the test solution. Evaporate the solution until dryness then a drop of sulphuric acid was added. The colour was observed.)

2.2.7 Mandelin's test (Apply 1-2 drops of 0.5% aqueous ammonium vanadate solution to the test solution. Evaporate until dryness and a drop of sulphuric acid was added. The colour was observed.)

2.2.8 Vitali's test (The test solution was evaporated until dryness. A few drop of fuming nitric acid were added. The colour was observed. Then evaporate the test solution on the water bath until dryness, observe the colour. A drop of freshly prepared ethanolic KOH was added. Observe the colour.)

2.3 Other tests

2.3.1 Specific colour test

2.3.2 Microcrystal test

The details were shown in Table 1.

2.4 The quantitative analysis

An antimalarial, chloroquine, was mostly found in Ya-Chud. The drug was assayed following the method in British Pharmacopoeia 1968.⁷

Results

1. The information from the patients

Five hundreds and seventy-four patients which represented the number of the families, were older than 18 years of age in Sai-Yok District, Kanchanaburi Province. Most of them were farmers. Eighty four point nine percent of them finished the primary school, 0.5 % the secondary school and 14.2 % were illiterate. The percentage of the people who were able to read and write were 82.2, only to read 0.9 % and unable to read and write 13.4%.

1.1 The knowledge about malarial infection

The malarial patients experienced common cold and influenza were 91.5 % and 67.8 %, respectively. They classified the symptoms of the common cold as congestion, catarrh, fever and headache; of the influenza as sore throat together with the high fever, and of the malarial infection as intermittent fever (Table 2).

1.2 The behaviour of malarial treatment

1.2.1 The first place where the people (75.8 %) went to when they were sick was either the groceries in the village that sale Ya-Chud for malarial infection or the drug stores in town (Table 3). When the treatment failed they went to clinic, to buy Ya-Chud again, to malaria clinic, to the city hospital, to health unit in the village and to the district hospital, which could be expressed into the following percentages of 22.8, 19.3, 19.0, 17.0, 11.6 and 0.7, respectively (Table 4).

The investigated areas received 65.8% of the health services from the governmental section. The service could alleviate the illness.

1.2.2 Where to get Ya-Chud for malarial infection

Seventy-one point eight percent of Ya-Chud was from groceries (Ran-Cham), the rest from the drug stores in town (Table 6). Ya-Chud was available for children and adults. Most people did not know even the name of the drug they had taken.

1.2.3 The behaviour in self-medication

When they went to the drug store, 94.8% of them asked the clerk for Ya-Chud for malarial infection, 17% mentioned the name of the drug they wanted and only 1.1% came to consult the illness and bought the drug from the clerk (Table 7).

1.2.4 The drug administration

Sixty-four point three percent of the people had been told to take the drug after meal, 34.2% did not get any advice from the clerk, the others had been suggested to take a certain number of Ya-Chud or not to take some food with drug.

1.2.5 The behaviour of administering Ya-Chud and the result of the medication

Most of the patients took Ya-Chud once a day until the illness was relived. Twice a day and three times a day of administration were not frequently found. The result of the medication found was not certain (67.9%), successful (14.7%), better (13.6%) and unsuccessful (2.5%) (Table 5). The number of Ya-Chud taken in each attack was also uncertain. The drug allergy occurred in these areas were tinnitus, blurred vision, nausea, vomiting, dizziness, palpitation and drowsiness (Table 8, 9). When they were allergic to drug, 65% of them stopped taking the drug at once. The others went to clinic, health unit, hospital and the drug store.

1.3 The appearance of Ya-Chud

Varying number of plain tablets, sugar-coated tablets and capsules were found in one Ya-Chud. Most Ya-Chud composed of 4-5 types of drugs and the price was 3-5 bahts.

2. The informations from the clerks

The clerks were saleclerks in the groceries (Ran-Cham) who were more than 18 years of age. The number of the clerks from each grocery interviewed was 147 persons, sixty-three point four percent of the clerks finished primary school, 5.4% were illiterate and the others could neither read nor write.

2.1 How to get Ya-Chud for sales

There were two ways to get Ya-Chud

- i. the salesman coming from the drug stores in town
- ii. the clerks went to buy Ya-Chud for malarial infection from the drug stores in town

2.2 The types of Ya-Chud

There were available as the strong and mild Ya-Chud, and for children and the adults. Some groceries sold just one kind of Ya-Chud, i.e., Ya Chud for malarial infection.

One Ya-Chud contained 3-6 drugs; Ya-Chud contained 4 drugs was mostly found (34.2%). The price of one Ya-Chud varied from 3-5 bahts. Ya-Chud bought at different time were not the same; they were sometimes either totally or

partly different. The time that one lot of Ya-Chud came in the groceries was with in 2 weeks to 2 months period.

2.3 The administration of Ya-Chud

Ya-Chud used by patients composed of 1-5 drugs. Ya-Chud composed of 3 drugs was always dispensed (48.4 %) The result of the medication was uncertained (64.0 %), failed (0.9 %), and successful (34.2 %) (Table 11). The drug allergy was not observed by the clerk.

2.4 The behaviour in buying Ya-Chud of the patients

Forty-six point three percent of the patients asked for Ya-Chud for malarial infection from the clerk, 45.2 % consulted the clerk about the illness and bought the drug suggested by the clerk and 7.9 % of patients bought specific drugs they wanted. The amount of Ya-Chud bought each time depended on money they had. Forty-one point seven percent of the patients bought Ya-Chud once was enough for taking three times, 40.3 % for taking two times and 8.3 % for one time. Seventy-nine point eight percent of the patients received the advice about the administration of drugs (i.e., take the drug every 4 hour, take the drug before meal) and 20.2 % recieved no advice.

2.5 The knowledge of the clerks about the disease

The symptoms of malarial infection that they knew are the intermitten fever and headache (Table 10).

3. The drug analysis

3.1 Types of drug presented in a Ya-Chud

One hundred and ninety-three samples of Ya-Chud were collected from groceries (Ran-Cham) in the villages of Sai-Yok District, Kanchanaburi Province. Only sixty-five point three percent (163 samples) of all examined Ya-Chud included antimalarial drugs.

Antimalarials in Ya-Chud were chloroquine, mepacrine (quinacrine), primaquine and amodiaquine. The drug dispensed solely was Fansidar (sulphadoxine plus pyrimethamine).

Table 12 showed the nature and the amount of antimalarials in a Ya-Chud. Twenty-seven point eight percent of examined Ya-Chud contained one tablet of chloroquine. Thirty-two point five percent of Ya-chud composed of combined antimalarials. The rest had only one antimalarial drug. The combined antimalarials were dispensed as followed:

chloroquine plus primaquine in the ratio of 2 : 1, 1 : 1, and 3 : 1
chloroquine plus mepacrine in the ratio of 1 : 1 and 1 : 2
chloroquine plus amodiaquine in the ratio of 1 : 1
chloroquine plus mepacrine plus primaquine in the ratio of 2 : 2 : 1,
1 : 2 : 1 and 1 : 1 : 1

Chloroquine was almost found in Ya-Chud and the second was mepacrine. Other categories of these drugs are shown in Table 13. were analgesics-antipyretics

(74.0 %), antimicrobial agents (either chloramphenicol, tetracyclines or sulphonamides) (21.4 %), vitamins (21.7 %), steroids (7.9 %) and tranquilizers (7.9 %). Thirty-four point seven percent (67 samples) of Ya-Chud comprised none of antimalarials but analgesics-antipyretics, antihistamine, vitamins, antimicrobials, tranquilizers and steroids. The number of drugs found in one Ya-Chud were 3 (17.0 %), 4 (39.2 %), 5 (35.6 %) and 6 (8.2%) tablets or capsules.

It was noted that analgesics-antipyretics were found in the form of tablet and capsule were varied in colours, shapes and sizes.

3.2 The quantitative analysis

Chloroquine was selected for quantitative analysis study. The analysis was repeated five times and 14 samples of chloroquine were used. The result was shown in Table 14.

Only 4 from 14 samples of chloroquine (250 mg/tablet) conformed to the standard. The rest contained 10.0 % less active ingredient. The standard deviation of the amount of the drug was allow in the range of 3.4-8.1 %. The minimal standard deviation (1.3 %) was observed in only one sample.

Discussion and Conclusion

1. The behaviour of self-medication in the endemic area

Ya-Chud for malarial infection was the first choice of the people in the endemic areas. Some families have Ya-Chud available at home. The people knew the symptom of malarial infection as the intermittent fever, that self diagnosis was easily mistaken. Herbal medicines was scarcely found. This indicated the popularity of the modern medicines. Some of the patients did not go to further treatment even self-medication was failed because they were very poor.

The choice of the health services depended on the distance and the cost. Most people were farmers and labour workers. Their income was irregular. They did usually not go to the hospital if it is too far and they have to leave the job without pay. In spite of the unsuccessful treatment, the patients still selected self-medication by taking Ya-Chud. It might be the reason that they are poor and the inconvenience to get to the hospital.

The improper use of the drugs could occur at any time of self-medication. The clerks and the consumers are not well educated. They did not know so well about the use of the drugs.

2. Ya-Chud for malarial infection

Drugs in Ya-Chud composed of tablets and capsules varying in colours, shapes and sizes, put together in a plastic bag. The drugs were found in the combination of 3-5 categories of the followed; antimalarials, analgesics-antipyretics antimicrobial agents, vitamins, tranquilizers and steroids.

2.1 Varying forms of drugs did not give any benefit to the consumers.

More than 10 forms of analgesics-antipyretics were observed in Ya-Chud. It might be found as capsules which were easily mistaken for antimicrobial

agents, It would be a good practice to have somewhat official form of the drug.

2.2 The drug combination

The qualitative analysis indicated that

2.2.1 The insufficient dose of antimalarials in Ya-Chud, e.g., one tablet of either chloroquine or primaquine, etc., caused the failure of the treatment.

2.2.2 The improper combination of antimalarials, e.g., chloroquine plus mepacrine (1:1 or 1:2). Not only the dose of the drug not enough to kill the parasites but also increased the toxicity of mepacrine.

2.2.3 The unnecessary drugs in Ya-Chud

Analgesics-antipyretics

Seventy-four percent of Ya-Chud composed of analgesics-antipyretics. The illness might be somewhat relieved but the side effects of the salicylates could occur. The patient tended to have hemolysis due to the parasites. Salicylates would increase the symptom⁸.

Antimicrobial agents

Tetracyclines and sulphonamides could be used in conjunction with quinine⁹, and either pyrimethamine or trimethoprim¹⁰, respectively. The proper combination of such medication was found none. In case of chloramphenicol aplastic anemia was the serious side effect. When it was used with mepacrine the toxicity would highly increased¹¹.

Vitamins

It might be supplemental to those who were malnutrition but it did not kill the parasites.

Tranquilizers

The drugs could easily caused the abuse and the addiction.

Steroids

It could be injected to those who were acute attacked in order to relieve the symptoms. Steroids in Ya-Chud did not give any benefit but the adversed effects, i.e., immuno-suppression, peptic ulcer and etc.¹²

However the proper combination of antimalarials were found in some Ya-Chud, e.g., two tablets of chloroquine, chloroquine plus primaquine (2:1) and etc. Unfortunately the medication was not long enough to cure the disease, except the single dose administration of Fansidar (sulphadoxine plus pyrimethamine). Quinine was not found in any Ya-Chud, presumably because of its cost.

3. The impacts from self-medication by Ya-Chud

3.1 The improper use of the drugs

3.1.1 The patients who took Ya-Chud received the insufficient dose of antimalarial drug and they did not take the drug properly.

3.1.2 The duration of administering the drug was not long enough to kill the parasites.

The proper administration of chloroquine was : 4 tablets (1,000 mg) initially, then 2 tablets every 6 hour. Two tablets twice a day the second and third days. The investigated Ya-Chud each contained only one tablet of chloroquine.

The proper administration of primaquine was : two tablets twice a day for 10-14 days. If the parasite was *P. vivax* it should be used with chloroquine in order to prevent the relapsing fever. The investigation of Ya-Chud revealed that there were one tablet of primaquine.

The number of malarial patients have been steadily increased may be a result of the improper use of the drugs.

3.2 The unnecessary drugs used in Ya-Chud

Some Ya-Chud contained not only antimalarials but also other groups of drugs, e.g., analgesics-antipyretics, antihistamines, steroids and antimicrobial agents, etc. These drugs could not kill the malarial parasites. Some drugs might be relieve the symptoms. This possibly caused the increasing of the price, the side effects and the drug interaction.

3.3 The analysis of chloroquine

The quantitative analysis revealed that chloroquine in Ya-Chud mostly contained the active ingredient below the standard. Only 4 in 14 samples were conformed to the standard. The insufficient dose of chloroquine easily caused the drug resistance, especially in case of *P. falciparum*

3.4 The drug toxicity

Mepacrine (quinacrine) is now obsolete for malarial infection because of its high toxicity (dizziness, headache, nausea, vomiting and aplastic anemia)¹⁸. The investigated Ya-Chud contained mepacrine. The high toxicity could be expected from the combination of mepacrine with chloramphenicol, primaquine or with salicylates group of analgesics-antipyretics.

According to the low income, self-medication by taking Ya-Chud has been the first choice of the people in the endemic areas. The result of the investigation revealed the highly insufficiency of the governmental health services in the upcountry, the drug resistance and a risk to drug toxicity.

Thanks to Dr. Chaiya Poolthong who initiated this project.

Table 1. Chemical Test : Colour test, Specific test, Microcrystal test

Drug	H ₂ SO ₄	HNO ₃	HCl	FeCl ₃ T.S.	Marquis	Mandelin	Vitali
Quinine	-	blue	yellow	orange	blue	-	blue/orange/ brown
Chloroquine	-	-	-	green	-	-	-
Mepacrine	orange	orange	yellow	yellow	orange	orange	yellow/violet/ violet
Primaquine	-	-	bubble	green	orange	violet	green/orange/ yellow
Sulphadiazine	-	-	-	-	orange	green	yellow/orange/ brown
Chloramphenicol	-	-	-	-	-	-	-
Tetracycline	violet	-	-	-	orange	orange	yellow/yellow/ brown
Aspirin	orange	yellow	-	green blue	pink	green	-/yellow/brown
Paracetamol	orange	brown	-	green	pink	green	brown
APC.	yellow	orange	yellow	green violet	yellow	pink	violet/brown/ brown
Prednisolone	violet	violet	-	-	yellow	pink	violet/brown/ brown
Dexamethazone	pink	-	-	-	-	-	-/yellow/brown
Diazepam	violet	-	-	-	violet	green	-/green/brown
Chlordiazepox- -ide	yellow	-	-	-	yellow	green	-/brown/yellow
B.complex	red yellow	yellow	yel.	green	yellow	red	yellow/orange/ brown
Chlorpheni- ramine	orange	-	-	-	violet	green	-/yellow/brown
Cyprohepta- dine	-	-	-	-	green	blue green	-

Ninhydrin	Frohde	Specific test
-	blue	1. dissolve in dil. H_2SO_4 → fluorescent under UV light 2. - Br_2 water + NH_4OH conc. → green → +dil. HCl → blue → red 3. Microcrystal test: + potassium chromate → needle (crystal)
+	green	Microcrystal test: + picric acid → rosette of plate (crystal)
+	green	Microcrystal test: + potassium tri-iodide solution dense rosette of needle (crystal)
+	blue	Microcrystal test: + picric acid → rosette of curve needle or dense rosettes
-	-	1. Sulphadiazine: + 1% HAc . 0.5 ml → shake → + $CuSO_4$ 1% 4 drop → shake → + 2N $NaOH$ 1 drop → violet-brown solution (Chen's test) 2. Sulphamethoxazole: Chen's test → green 3. Sulphamethoxy-pyridazine: Chen's test → brown-green
+	blue	1. boiling with 5% $NaOH$ → orange + NH_3 2. Fujiwara's test: + pyridine 1 ml + 20% $NaOH$ 2 ml warm on water bath 3-5 min. shake well → red in pyridine layer
-	violet	Microcrystal test: + sodium carbonate solution → plate (crystal) see under polarised light
-	blue	1. + Trinder's reagent → violet 2. McNally's test: + acetone 2-3 drop + H_2O 1-2 ml → + 0.5% $CuSO_4$ in HAc 1-2 drop + solid sodium nitrite → shake → warm 2-3 min. → red
-	blue	1. Liebermann's reagent: + HCl warm 3 min. + H_2O 10 ml → cool → + 0.1 N potassium dicromate soln. → violet (slowly)
-	green	dissolve in H_2SO_4 1 ml → 5 min. fluorescent under UV light
-	brown	1. Microcrystal test: 1.1 + potassium cadmium iodide solution → bunch of prism (forming over night) 1.2 + potassium mercuric iodide solution → irregular rosettes (forming over night)
-	orange	Microcrystal test: + sodium carbonate solution → dense rosettes
-	violet	1. Microcrystal test: 1.1 + platinic iodide solution → long plate and needle 1.2 + lead iodide solution → dense rosettes
-	blue green	Microcrystal test: + potassium iodide solution → dense rosettes

Table 2. The patient's knowledge of malarial symptoms

Symptom	percent
Intermittent fever	44.7
Headache, nausea and vomiting	17.8
Muscle pain, headache and fever	35.9
Black urine and fever	0.2
No answer	1.5
Total	100.0
N	574

Table 3. Initial sources of medication of malarial patients

source	areas (Tambol)							Total
	Sri-Mongkol	Lumsom	Bongti	Ta-Sao	Singh	Vangkrajae	Sai-Yok	
Self-medication	72.8	65.0	61.1	79.6	78.7	69.4	90.2	75.8
Malaria clinic	8.7	27.8	-	3.7	8.5	1.4	2.2	8.6
Private clinic	3.3	-	-	10.2	-	25.0	5.4	6.4
District hospital	1.1	-	-	-	1.1	-	-	0.4
City hospital	7.6	1.0	-	3.7	6.4	1.4	1.1	3.4
Health unit	1.1	1.0	-	2.8	3.2	-	1.1	1.6
Folk doctor	1.1	-	-	-	-	1.4	-	0.4
Others	4.3	5.2	38.9	-	2.2	1.4	-	3.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	93	96	18	107	94	74	91	574

Table 4. Alternative sources of medication after the initial treatment failure

source	areas (Tambol)							Total
	Sri-Mongkol	Lumsom	Bongti	Ta-Sao	Singh	Vangkrajae	Sai-Yok	
Self-medication	18.9	10.3	38.9	3.7	21.3	14.9	43.9	19.3
Malaria clinic	32.2	33.3	-	19.3	25.5	6.7	1.1	19.0
Private clinic	3.3	1.3	-	42.2	2.1	52.7	38.5	22.8
District hospital	2.2	-	-	0.9	1.1	-	-	0.7
City hospital	34.5	29.5	5.6	9.2	16.0	14.9	3.3	17.0
Health unit	2.2	5.1	-	23.8	19.1	8.1	8.8	11.6
Folk doctor	-	-	-	-	-	-	-	-
Others	6.9	19.2	50.0	0.9	12.8	-	-	7.8
No answer	-	1.3	5.6	-	2.1	2.7	4.4	1.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	93	96	18	107	94	74	91	574

Table 5 Results of self-medication after taking Ya-Chud

result	areas (Tambol)							Total
	Sri-Mongkol	Lumsom	Bongti	Ta-Sao	Singh	Vangkrajae	Sai-Yok	
Success	10.9	6.7	8.3	17.6	2.9	20.6	24.2	14.7
Better	10.9	8.6	16.7	22.2	8.6	16.4	9.9	13.6
Unsuccess	3.1	6.7	-	-	7.1	1.4	-	2.5
Uncertain	73.4	75.9	66.7	59.3	81.4	60.3	64.8	67.9
Not know	-	-	-	0.9	-	-	-	0.2
Others	-	-	8.3	-	-	-	-	0.2
No answer	1.6	1.7	-	-	-	1.4	1.1	0.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	93	96	18	107	94	74	91	574

Table 6 Places that Ya-Chud for malarial infection is available

place	areas (Tambol)							Total
	Sri-Mongkol	Lumsom	Bongti	Ta-Sao	Singh	Vangkrajae	Sai-Yok	
Ran-Cham	78.8	58.8	91.7	70.9	83.6	49.3	80.0	71.8
Drug store in District	4.6	11.8	-	24.8	2.5	30.1	7.4	13.9
Drug store in Province	16.6	14.7	-	4.3	10.1	16.5	4.2	9.8
Others (private clinic)	-	14.7	8.3	-	2.5	2.7	4.2	3.7
No answer	-	-	-	-	1.3	1.4	4.2	1.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	93	96	18	107	94	74	91	574

Table 7 Patient's behaviours in self-medication

behaviour	areas (Tambol)							Total
	Sri-Mongkol	Lumsom	Bongti	Ta-Sao	Singh	Vangkrajae	Sai-Yok	
Ask for specific drugs	1.6	8.5	-	-	-	1.4	1.1	1.7
Consult the illness	-	3.4	-	1.9	-	-	1.1	1.1
Ask for antimalarials	98.4	83.1	66.7	98.1	98.6	95.7	93.4	94.8
Others	-	1.7	33.3	-	1.4	-	-	0.7
No answer	-	3.3	-	-	-	2.9	4.4	1.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	93	96	18	107	94	74	91	574

Table 8 Drug allergy after taking Ya-Chud

Drug allergy	Percent
Yes	23.6
No	75.9
No answer	0.5
Total	100.0
N	574

Table 9 Symptoms of drug allergy

Symptom	percent
Nausea, vomiting	19.4
Dizziness, palpitation	15.3
Drowsiness	3.5
Tinnitus, blurred vision	59.7
No answer	2.5
Total	100.0
N	135

Table 10 Knowledge of the clerks for malarial infection

Symptom	percent
Fever	26.5
Headache	18.5
Intermittent fever	38.3
Muscle pain	13.6
No answer	3.1
Total	100.0
N	147

Table 11 Results of self-medication (information from the clerks)

Result	percent
Uncertain	64.0
Failure	0.9
Success	34.2
No answer	17.9
Total	100.0
N	147

Table 12 The types and the quantities of antimalarials in a Ya-Chud

Chloroquine (tab/cap)	Mepacrine (tab)	Primaquine (tab)	Amodiaquine (tab)	Pyrimethamine plus sulpha- doxine (tab)	number	%
1	-	-	-	-	35	27.8
2	-	-	-	-	3	2.4
-	1	-	-	-	21	16.6
-	2	-	-	-	11	8.7
-	-	1	-	-	11	8.7
-	-	-	-	2	4	3.2
2	-	1	-	-	17	13.5
1	-	1	-	-	1	0.8
3	-	1	-	-	2	1.6
2	2	1	-	-	3	2.4
1	2	1	-	-	4	3.2
1	1	1	-	-	3	2.4
1	1	-	-	-	7	5.6
1	2	-	-	-	2	1.6
1	-	-	1	-	1	1.6
total					126	100.0

Table 13 Other categories of drugs in a Ya-Chud

Drug	Number	%
Analgesics-antipyretics	94	74.0
Antimicrobial agents	27	21.4
chloramphenicol	(7)	(5.6)
tetracyclines	(9)	(7.1)
sulphonamides	(11)	(8.7)
Vitamins	40	31.7
Steroids	10	7.9
tranquilizers	10	7.9

Table 14. The quantitative analysis of chloroquine in the investigated Ya-Chud compared with the standard chloroquine

No.	Content (mg/tab)	Standard deviation (%)
1	237 ± 3*	1.3
2	236 ± 8*	3.4
3	124 ± 10**	8.1
4	224 ± 14	6.3
5	219 ± 14	6.4
6	208 ± 13	6.3
7	222 ± 12	5.4
8	222 ± 14	6.3
9	204 ± 11	5.4
10	201 ± 12	5.9
11	228 ± 9*	3.9
12	231 ± 15*	6.5
13	196 ± 16	8.1
14	200 ± 13	6.0

* = the standard chloroquine

** = the sample with the physical appearance changed

เอกสารอ้างอิง

1. นิภา จรูญเวสม์ กวี เจริญลาภ ลาวัณย์ เมืองมณี และนลินี อัสวโกที (2520) โรคเขตร้อน โครงการตำราศิริราช คณะแพทยศาสตร์ศิริราช มหาวิทยาลัยมหิดล หน้า 39.
2. นิภา จรูญเวสม์ และคณะ (2520) อ้างแล้ว หน้า 66.
3. Pinitpongs, S. (1980) *The Status of Malarial Infection in Thailand 1980*. National Malarial Conference 1. Thailand.
4. Gilman, A.G., Goodman, L.S. and Gilman, A. (1980) *The Pharmacological Basis of Therapeutics*, 6th Edition, Macmillan Publishing Co. Inc. p. 1479.
5. Modell, W. (1980) *Drugs of Choice 1980-1981*. The C.V. Mosby Company, United States of America, p. 166.
6. Clarke, E.G.C. (1969) *Isolation and Identification of Drugs*. The Pharmaceutical Press, London.
7. British Pharmacopoeia 1968, p. 194-198.
8. Gilman, A.G., Goodman, L.S. and Gilman, A. (1980) *The Pharmacological Basis of Therapeutics*, 6th Edition, Macmillan Publishing Co. Inc. p. 684.
9. Gilman, A.G. *et al.* (1980) *Ibid.*, p. 1058.
10. Gilman, A.G. *et al.* (1980) *Ibid.*, p. 1049.
11. Gilman, A.G. *et al.* (1980) *Ibid.*, p. 1193-1194.
12. Gilman, A.G. *et al.* (1980) *Ibid.*, p. 1478-1479.
13. Gilman, A.G. *et al.* (1980) *Ibid.*, p. 1042.