Technical Cooperation Project		
The NIH activities	The project activities	Target to be acheived at NIH
	The main project activities are to support	health promotion of the whole nation.
8. Environmental Health Science The responsibility of "environmental health science research unit": Fundamental and applied research in the pollution of environment which became serious problem in Thailand; study on prevention of environmental toxic substances, pathological study on toxic substances, study on antipollution standards and regulations. Toxic substances involve: pestides, mycotoxins, carcinogens etc.	8. Environmental Health Science 8.1 To advise on the evaluation of toxic substances in human environments caused by chemical poisons and other natural sources by physico-chemical means. 8.2 To raise the capability to conduct the histopathological study of experimental animals used for the test of the environmental toxic substances.	8.1, 8.2 To prevent and control the toxic substances in order to ensure the public safety and health promotion.
9. Pharmaceutical Sciences The responsibility of "pharmaceutical science unit": Research on effectiveness, safety and stability of medicines and pharmacological research by means of animal experiments (e.g.	9. Pharmaceutical Sciences 9.1 To upgrade the capability to donduct the qulity assessment of medicine by RIA, physico-chemical, microbiological and animal assays.	9.1 To control the quality of pharmaceutical products in dosage form as well as the efficiency of medicine in form of therapeutic

Technical Cooperation Project		
The NIH activities	The project activities	Target to be acheived at NIH
	The main project activities are to support health promotion of the whole nation.	
bioassay of hormone and vitamin etc) and by immunological (RIA) technique (e.g. digoxin and DMPA).	9.2 To advise to prepare and perform the quality control of radiopharmaceutical products.	9.2 To distribute to the hospitals.
(Supportive activities) 1. Animal Experiment Center The responsibility of Animal Experiment Center: This center will be newly established to promote adequate and effective animal experiments which have been carried out separately in each division under incomplete condition; the Center will be responsible for management of animal experimentations, animal experimentation using sophisticated equipment, production and supply of animals for special purpose and	1. Animal Experiment Center 1.1 To advise to purchase, acquire, quarantine and housing of normal animal for experimentation. 1.2 To raise the capability to manage animal for experimentation, housing, control and sacrification of infected animals.	1.1, 1.2 To act as a center for animal experiment facilities.

Technical Cooperation Project		
The NIH activities	The project activities	Target to be acheived at NIH
	The main project activities are to support health promotion of the whole nation.	
2. Scientific Instrument Center The responsibility of Scientific Instrument Center: This center will be newly established to facilitate daily inspection and maintenance, through centralized control of high performance equipment and those requiring specialized technology for operation.	2. Scientific Insturment Center 2.1 To assist the researcher in the area of technical instrumentation. 2.2 To set up hardware, possible soft ware and to implement support for the NIH's Computer network.	2.1 To support the main activities at NIH in terrs of procurement, installation, utilization, maintenance and quality assurance of instrumentation. 2.2 To manage the computer system for smooth application.
3. Biohazard Laboratory This laboratory will be used for highly hazardous microorganisms of both viruses and bacteria as classified in P-3 category.	3. Biohazard Laboratory 3.1 To set up the P-3 facility laboratory.	3.1 To diagnose and study the diseases caused by highly hazardous microorganism.

Technical Cooperation Project		
The NIH activities	The project activities	Target to be acheived at NIH
	The main project activities are to support health promotion of the whole nation.	
4. Radioisotope Laboratory This Laboratory serves as the supportive activity for other laboratories. The major responsibility involves all radioisotope experiments including both radioimmunoassay and radioisotope technique.	4. Radioisotope Laboratory 4.1 To raise the capability to conduct the radioimmuno assay experiments of chemical and microbiological substances. 4.2 To cooperate to carry out the radioisotope technique in the area of microbiology, toxicology, pharmacy and pharmacology. (Training) 1. To conduct the training on virology and other related area. 2. To organise the training in instrumentation for sophisticated instrument. 3. To arrange the seminar/workshop for the scientists all over the country.	4.1, 4.2 To fulfill the study by using radioisotope technique. 1. To raise the capability of the scientists performing the research 2., 3 To set as the national technical information center.

Appendix - 5

1. To enhance research in the field of infectious diseases, environmental health science, medicinal plant, biomedical research on food and pharmaceutical science.
2. To enhance research in basic and applied immunology.
3. To enhance research in biochemistry.
4. To introduce microbial genetic technology for the research of microbiology and for the development of new biological products.
5. To introduce radio isotope in the research stated above.
6. To train staffs in the bioassay of biologicals and pharmaceuticals.
7. To establish computer system in the study of biomedical sciences.

資　料　4

医科学局業績等

資料 4. 1.　医科学局研究発表業績

資料 4. 2.　細菌検査成績

資料 4. 3.　タイ国の寄生虫

資料4.1 医科学局研究発表業績

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RISK FACTORS IN DENGUE SHOCK SYNDROME: A PROSPECTIVE EPIDEMIOLOGIC STUDY IN RAYONG, THAILAND

I. THE 1980 OUTBREAK

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Sangkawibha, N., S. Rojanasuphot, S. Ahandrik, S. Viriyapongse, S. Jatanasen, V. Salitul, B. Phanthumachinda and S. B. Halstead (Dept. of Tropical Medicine, U. of Hawaii School of Medicine, Honolulu, HI 96816). Risk factors in dengue shock syndrome: a prospective epidemiologic study in Rayong, Thailand. I. The 1980 outbreak. *Am J Epidemiol* 1984;120:653-69.

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Definitions: *Dengue hemorrhagic fever,* a dengue syndrome characterized by hemoconcentration (hematocrit ≥20% above recovery value) and abnormal hemostasis (at least thrombocytopenia, ≤100,000 mm^3); *dengue shock syndrome,* a subset of dengue hemorrhagic fever with hypotension or narrow pulse pressure (≤20 mmHg); *heterotypic,* referring to different serotypes within a virus group; *homotypic,* referring to different virus strains within a single serotype; *monotypic,* referring to a single serotype; *multitypic,* referring to two or more serotypes within a virus group; *primary infection,* initial infection with a virus serotype; *secondary infection,* heterotypic infection of a monotypic immune individual; *tertiary infection,* heterotypic infection of a multitypic (two infections) immune individual; *undifferentiated fever,* a febrile illness without localizing or pathognomonic signs; *virulence,* capacity to cause disease, measured as a ratio between a clinically defined syndrome and total infections.

In January 1980, the municipal area of Rayong, Thailand, and contiguous suburban villages were chosen for a long-term study on dengue epidemiology. From 3,185 children randomly sampled in schools and households, the population prevalence of neutralizing antibody to the four dengue serotypes was estimated. To estimate the incidence of infection with each dengue virus serotype (dengue seroconversions), first grade children were re-bled in January 1981 (cohort study). Children admitted to hospital were studied for dengue virus isolation and antibody responses in paired sera. An epidemic of dengue occurred in 1980. Plaque reduction neutralization tests of 1,009 pre-epidemic sera from children aged <1–10 years of age determined that 3.3% were immune to dengue 1, 13.2% to dengue 2, 6.4% to dengue 3, and 5.8% to dengue 4. Examination of pre- and post-epidemic cohort blood samples revealed that the incidence of dengue infection in 251 seronegative children was 39.4% (15.1% dengue 1, 11.1% dengue 2, 2.0% dengue 3, 4.8% dengue 4, and 6.4% two or more dengue viruses). Among the 52,935 residents of the study area, there were 22 cases of virologically and clinically confirmed dengue shock syndrome, in children 15 years or younger. All 22 shock syndrome cases had secondary type antibody responses. Eight of 22 had been included in the random serologic sample prior to onset of shock; five had been immune to dengue 1, two to dengue 3, one to dengue 4, and none to dengue 2. Despite the high rate of dengue 1 infections in 1980, only dengue 2 viruses were recovered from dengue shock syndrome cases, including two dengue 1 immune children with pre-illness serum specimens. Although the pre-epidemic prevalence of antibodies to dengue 1 was the lowest to any type, children with this immunologic background contributed disproportionately to shock cases. In descending order of magnitude, risk factors for dengue shock syndrome in Rayong were secondary infections with dengue 2 which followed primary infections with dengue 1, dengue 3, or dengue 4.

antibodies, viral; dengue; hemorrhagic fevers, viral; immunologic diseases; neutralization tests

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資料 4.2 細 菌 検 査 成 績

資 4.2.1 Main Salmonella Serotypes Isolated During January - December 1983

Man		Food		Animal		Animal Food		water	
Serotype	No.	Serotype	No.	Serotype	No.	Serotype	No.	Serotype	No.
S. krefeld	465	S. typhi-murium	23	S. typhi-murium	50	S. montevideo	1	S. typhi-murium	7
S. weltevreden	345	S. weltevreden	22	S. weltevreden	30			S. senftenberg	5
S. typhi-murium	337	S. derby	17	S. london	17			S. java	4
S. agona	278	S. anatum	16	S. agona	16			S. krefeld	3
S. derby	273	S. panama	15	S. virchow	11			S. derby	2
S. typhi	205	S. senftenberg	14	S. lexington	11			S. bovis-morbificans	2
S. bovis-morbificans	146	S. virchow	11	S. derby	9			Sal 8,20:-:-	2
S. anatum	126	S. bovis-morbificans	9	S. infantis	9			S. thompson	1
S. paratyphi A	95	S. montevideo	8	S. anatum	9			S. brunei	1
S. lexington	94	S. london	7	S. singapore	8			S. dublin	1
S. panama	79	S. krefeld	7	S. senftenberg	7			S. javiana	1
S. javiana	74	S. lexington	6	S. krefeld	7			S. weltevreden	1
S. newport	63	S. singapore	5	S. newport	6			S. rubislaw	1
S. java	51	S. agona	4	S. panama	6			S. havana	1
S. london	43	S. saint-paul	4	S. thompson	5			S. hvittingfoss	1
Other types (55)	459	Other types (20)	27	Other types (13)	23				
Total	3,133	Total	195	Total	224	Total	1	Total	33
*Including									
S. arizonae (16:1,v:z)	1								
S. arizonae(61:1,v:1,5)	1								

資 4.2.2 Shigella and Escherichia

Shigella 2,637 strains (27 serotypes)

S. dysenteriae type 2	141
S. dysenteriae types 4, 8, 9	7
S. flexneri type 1b	39
S. flexneri type 2a	1515
2b	59
3a	82
4a	172
others	7
S. boydii type 2	28
type 4	44
type 8	20
others	10
S. sonnei phase I	329
phase II	38
phase I and II	74

Enteropathogenic E. coli 268 strains (18 serotypes)

E. coli 0126 : K71	73
E. coli 0119 : K67	48
	etc.

資 4. 2. 3 Confirmation of Glucose Nonfermentative gram-negative rod 1983-1984

Name of Bacteria	1983		1984	
	no. of strain	%	no. of strain	%
Pseudomonas aeruginosa	64	12.10	54	10.59
P. fluorescens	2	0.38	13	2.55
P. putida	49	9.26	75	14.71
P. stutzeri	17	3.21	24	4.71
P. mendocina	7	1.32	2	0.39
P. alcaligenes	9	1.70	2	0.39
P. pseudoalcaligenes	15	2.83	7	1.37
P. pseudomallei	21	3.97	19	3.72
P. mallei	-	-	-	-
P. cepacia	79	14.93	99	19.41
P. pickettii	2	0.38	-	-
P. VA-1 group	4	0.76	2	0.39
P. VA-2 group	1	0.19	-	-
P. acidovorans	5	0.94	4	0.78
P. testosteroni	-	-	-	-
P. diminuta	3	0.57	3	0.59
P. vesicularis	2	0.38	3	0.59
P. maltophilia	24	4.54	14	2.74
P. paucimobilis	2	0.38	20	3.92
P. IIK-1	-	-	-	-
P. IIK-2	3	0.57	1	0.19
P. VE-1	2	0.38	5	0.98
P. VE-2	10	1.89	3	0.59
P. putrefaciens	12	2.27	9	1.76
P. IV e	1	0.19	-	-
Pseudomonas sp.	3	0.57	5	0.98
Alcaligenes faecalis	1	0.19	-	-
A. denitrificans	-	-	1	0.19
A. odorans	2	0.38	-	-
Alcaligenes sp.	1	0.19	-	-
Achromobacter xylosoxidans	5	0.94	7	1.37
Achromobacter group Vd-1	-	-	2	0.39
Achromobacter group Vd-2	1	0.19	-	-
Achromobacter sp.	3	0.57	-	-
Flavobacterium meningosepticum	4	0.76	12	2.35
F. group IIB	6	1.13	11	2.16
F. odoratum	3	0.57	3	0.59
Moraxella urethralis	2	0.38	-	-
M. osloensis	1	0.19	5	0.98
M. phenylpyruvica	2	0.38	2	0.39
M. nonliquefaciens	-	-	1	0.19

Name of Bacteria	1983		1984	
	no. of strain	%	no. of strain	%
Moraxella sp.	32	6.05	14	2.74
Acinetobacter calcoaceticus biotype anitratus	101	19.10	51	10.00
Acinetobacter calcoaceticus biotype lwoffii	19	3.59	21	4.12
Acinetobacter calcoaceticus biotype haemolyticus	3	0.57	7	1.37
Chromobacterium violaceum	5	0.94	8	1.57
Agrobacter radiobacter	-	-	1	0.19
Total	529		510	

資料 4.3　タ イ 国 の 寄 生 虫 一 覧 表

(1) Protozoa

Entamoeba histolytica

Giardia lamblia

Trichomonas vaginalis

Leishmania donovani, L.tropica, L. braziliensis

Trypanosoma gambiense, T. rhodesiensis, T. cruzi

Plasmodium vivax, P. faciparum, P. malariae, P. ovale

Isospora belli, I. hominis

Toxoplasma gondii

Pneumocystis carinii

Sarcocystis bovihominis

Balantidium coli

(2) Helminth

Fasiolopsis buski

Echinostoma malayanum, E. ilocanum, E. revolutum

Hypodereum conoideum

Phaneropsolus bonnei

Prosthodendrium molenkampi

Haplorchis taichui, H. yokogawai, H. pumilio

Gastrodis coides hominis

Opisthorchis viverrini, O. felineus

Clonorchis sinensis

Fasciola gigantica , F. hepatica

Dicrocoelium dendriticum

Eurytrema pancreaticum

Paragonimus westermani

P. heterotremus

Schistosoma japonicum, S. mansoni, S. haematobium

S. mekongi

Taenia saginata, T. solium

Echinococcus granulosus, E. multilocularis

Hymenoloepis nana, H. diminuta

Dipylidium caninum

Multiceps multiceps

Raillietina siriraji

Diphyllobothrium latum

Spargnum mansoni

Ascaris lumbricoides

Trichuris trichiua

Enterobius vermicularis

Necator americanus

Ancylostoma ceylanicum, A. duodenale, A. braziliense,
A. caninum

Trichostrongylus spp.

Strongyloides stercoralis

Angiostrongylus cantonensis

Capillaria philippinensis

Trichinella spiralis

Gnathostoma spinigerum

Anisakis larvae

Wuchereria bancrofti

Brugia malayi

Loa loa

Acanthocheilonema perstans, A. streptocerca

Mansonella ozzardi

Onchocerca volvulus

Dirofilaria immitis

Dracunculus medinensis

Macracanthorhynchus hirudinaceus

Moniliformis moniliformis

資　料　5

医科学局関連分野の
参　考　資　料

資料 5. 1.　原子力平和利用に関する法規

資料 5. 2.　Chulalongkorn 大学機器センター

資料 5. 3.　タイ国立動物センター

資料 5. 4.　生　物　製　剤

資料 5. 5.　環境衛生問題

資料 5.1

ATOMIC ENERGY FOR PEACE ACT

MINISTERIAL REGULATIONS

OFFICE OF THE ATOMIC ENERGY FOR PEACE
BANGKOK, THAILAND

ATOMIC ENERGY FOR PEACE ACT B.E. 2504

BHUMIBOL ADULYADEJ, REX,
Given on the 14th day of April, B.E. 2504;
Being the 16th Year of the Present Reign.

His Majesty King Bhumibol Adulyadej is graciously pleased to proclaim that;

Whereas it is expedient to have a law on atomic energy for peace;

Be it, therefore, enacted by the King, by and with the advice and consent of the Constituent Assembly acting as National Assembly, as follows:

Section 1. This Act shall be called the "*Atomic Energy for Peace Act, B.E. 2504.*"

Section 2. This Act shall come into force as and from the day following the date of its publication in the Government Gazette.(1)

Section 3. In this Act,

"*Atomic energy*" means energy in any form released in the course of nuclear fission, fusion or transformation;

"*Source material*" means

(1) Uranium, thorium, compound of uranium or thorium, or other material having properties of source material as determined by a Ministerial Regulation;

(2) Mineral or ore containing one or more of the materials specified in (1) in such concentration as determined by a Ministerial Regulation;

"*Special nuclear material*" means

(1) Plutonium, uranium enriched by uranium 233 or uranium 235 compound of the said elements, or any other material as determined by a Ministerial Regulation, but does not include source material;

(2) Any material enriched by one or more of the materials specified in (1), but does not include source material;

"*By-product*" means every radioactive material, except special nuclear material, resulting from the production or utilization of nuclear material or special nuclear material;

"*Commission*" means the Atomic Energy Commission for Peace;

"*Member*" means a member of the Atomic Energy Commission for Peace and includes the Chairman;

"*Competent official*" means a person appointed by the Minister for the execution of this Act;

"*Minister*" means the Minister who takes charge and control of the execution of this Act.

Section 4. The Minister shall have the power

(1) to determine as special nuclear material such material as the Commission considers to be special nuclear material;

(2) to determine the following material, mineral or ore:

(1) Government Gazette. Vol. 78, No. 36, 25th April B.E. 2504 (1961), pp. 423—436.

a. material which the Commission considers to have the properties of source material;

b. mineral or ore containing uranium, thorium, compound of uranium or thorium, or one or more of the materials specified in a., having a specified concentration and being considered by the Commission to be source material;

(3) to determine the conditions and method respecting the application for licence under this Act;

(4) to determine the conditions to be fulfilled by the licensee under Section 12 for the interest of safety in production, possession or utilization of special nuclear material which has been chemically transformed, or in causing by any means whatsoever the source material to be chemically transformed, and to require such licensee to report to the Commission, at such period as it thinks reasonable, the increase or decrease in quantity of the material in his possession as well as the reason for such increase or decrease.

The determination under this Section shall be made by a Ministerial Regulation.

Section 5. There shall be an Atomic Energy Commission for Peace called in brief "*A.E.C.*" having power and duty of carrying out matters concerning atomic energy for peace under this Act; consisting of a chairman and not exceeding ten qualified members in the fields of science, engineering, medicine, agriculture and law, to be appointed by the Cabinet, and the Rector of the University of Medical Science, Rector of the University of Agriculture, Rector of Chulalongkorn University, Director-General of the Department of Science, Director-General of the Department of Mines, Secretary-General of the National Energy Authority, representative of the Ministry of Defence Director-General of the Meteorological Department, Secretary-General of the National Rerearch Council, Secretary-General of the National Education Council and Secretary-General of the Office of Atomic Energy for Peace as ex-officio members.

The Secretary-General of the Office of Atomic Energy for Peace shall be the Secretary of the Commission.

Section 6. The Chairman of the Commission and the qualified members shall hold office for a term of four years. The retired member may be reappointed by the Cabinet.

Section 7. Apart from retiring on accunt of the termination under Section 6, the Chairman and the qualified members vacate their office upon:

(1) death;

(2) resignation;

(3) being a bankrupt;

(4) being incompetent or quasi—incompetent;

(5) being sentenced by a final judgment to imprisonement, except for a petty offence or offence committed by negligence.

In case where the chairman or a qualified member vacates his office before the termination of office, the Cabinet may appoint other person in his place.

The member appointed under the foregoing paragraph remains in office for the term of the member he replaces.

Section 8. In every meeting there must be present not less than one half of the total number of its members so as to constitute a quorum. Should the chairman of the Commission be absent from any meeting, the members present shall elect one from among themselves to preside over the meeting.

Any decision of the meeting shall be taken by a majority of votes. In voting, each member shall have one vote. In case of equality of votes, the presiding chairman shall have an additional vote as casting vote.

Section 9. Apart from those which have been specifically designated, the Commission shall have in general the following powers and duties:

(1) to establish the policy on, initiate, encourage and control

a. research, experimentation, examination, survey and collection of statistics, concerning sources of source materials;

b. procurement of source materials;

c. production and utilization of special nuclear materials, by-product materials and atomic energy;

d. research in atomic energy;

(2) to submit to the Minister recommendations on the matter concerning the determination of special nuclear materials and source materials;

(3) to lay down rules for the control and carrying out of activities so as to be in accordance with conditions in the licence issued under this Act;

(4) to determine various standards applicable in particular to atomic energy;

(5) to promote and propagate knowledge relating to atomic energy.

Section 10. The Commission may appoint sub-committee to consider or carry out any matter.

The provisions Section 8 shall apply to meeting of sub-committee mutatis mutandis.

Section 11. In the performance of its powers and duties the Commission shall have the power to summon any person to give statement and produce any document or article for supplementing its consideration.

Section 12. Unless a licence has been obtained from the Commission, no person shall

(1) produce, have in his possession or utilize special nuclear materials, atomic energy, by-product materials or source materials which have been chemically transformed;

(2) cause by any means whatsoever source materials to be chemically transformed.

The license shall be in such form as determined by the Commission.

Section 13. No person shall take out of or export from the Kingdom, or bring or import into the Kingdom, special nuclear materials, by-product materials or source materials unless a licence has been obtained from the Commission.

In issuing a licence, the Commission is empowered to determine therein for the purpose of safety certain conditions to be fulfilled by the licensee. The licence shall be in such form as determined by the Commission.

Where the licensee under this Section takes out of or exports from the Kingdom, or brings or imports into the Kingdom, materials specified in the licence without complying with or in contravention of the conditions in the licence, it shall be deemed that he has done so without obtaining licence under this Section.

Section 14. For the purpose of eliminating or preventing danger which may occur to persons or property, or protecting health of persons, the Commission is empowered to make a written order requiring the licensee under Section 12 to carry out in regard to the authorized activity, one or several of the following:

(1) to alter or repair buildings, machinery, equipment, tools and instruments;

(2) to procure or construct anything anew;

(3) to suspend the utilization or production until the order made under (1) and/or (2) has been complied with.

In making the order under (1) or (2), the commission shall also determine a period within which the licensee shall comply with such order. Such period may, upon a reasonable ground, be extended by the Commission.

Section 15. Where the licensee fails to comply with the order of the Commission made under Section 14 (1) or (2) within the period determined or extended by the Commission, or where the licensee violates or fails to comply with the ministerial regulation issued under Section 4 (4), the Commission is empowered to make a written order revoking the licence.

In case of a licence being revoked according to the foregoing paragraph, the licensee shall dispose of the special nuclear materials, by-product materials or source materials possessed or utilized by him under the licence within a period of ninety days; if disposal is not made within the said period, snch materials shall become property of State.

Section 16. In case where an order has been made under Section 14 (1) or (2), and after the period determined or extended by the Commission has expired, should the licensee fail to comply or comply incompletely or incorrectly with such order, the Commission is, irrespective of whether it has exercised the power under Section 15 or not, empowered to have such order executed completely. Any expense incurred thereby shall be borne by the licensee to such an extent as has actually been paid by the Commission.

Section 17. In carrying out his duties, the competent official shall have the power to enter any premises belonging to the Government or any person for questioning or checking in the matter of production, possession or utilization of special nuclear materials, atomic energy, by-product materials or source materials, or in the matter of eliminating or preventing danger which may occur to persons or property or protecting health of persons, or for carrying out other matters entrusted by the Commission.

As regards entry into premises according to the foregoing paragraph, if it is not a case of emergency or of necessity requiring an immediate act to eliminate or prevent danger, the Commission shall give a written notice to the occupier of the premises within a reasonable time in advance, and the competent official may make entry only during the time between sunrise and sunset.

Section 18. The competent official must possess an identity card which shall be in such form as determined by a ministerial regulation and must, in exercising the power under Section 17, show it upon request of any person concerned.

Section 19. There shall be established according to the law on organization of the Office of the Prime Minister, the Office of Atomic Energy for Peace, having the duty of carrying out matters in accordance with the resolution of the Commission and executing other administrative affairs.

Section 20 There shall be a Secretary-General of the Office of Atomic Energy for Peace, having the duty of general supervision and control of the official service of the Office of Atomic Energy for Peace.

Section 21. Whoever violates Section 12 shall be punished with imprisonment not exceeding one year or fine not exceeding ten thousand baht, or both.

Section 22. Whoever takes out of or exports from the Kingdom, or brings or imports in to the Kingdom, special nuclear materials, by-product materials or source materials without having obtained a licence under Section 13 shall be punished with imprisonment not exceeding six months or fine not exceeding five thousand baht, or both.

Section 23. Any person who has in his possession special nuclear materials, by product materials or source materials on the date of the coming into force of this Act shall manage to obtain a licence for the possession of same within a period of sixty days as from the date of the coming into force of this Act.

If, after the expiration of the period specified in the foregoing paragraph, any person who has in his possession special nuclear materials, by-product materials or source materials fails to apply for the licence of possession, or the Commission make order refusing the possession, the person in possesion of such special nuclear materials, by-product materials or source materials shall dispose of them within a period of ninety days as from the date of expiration of the period specified in the foregoing paragraph or as from the date of the order of refusal being made by the Commission, as the case may be; if disposal is not made within the said period, such materials shall become property of State.

The provisions of Section 12 dealing especially with the possession of special nuclear materials, by-product materials or source materials shall not apply to any person having been in possession of same on the date of the coming into force of this Act.

Section 24. The Prime Minister shall have charge and control for the execution of this Act, and shall have the power to appoint competent officials and to issue ministerial regulations for carrying out this Act.

Such ministerial regulations shall come into force upon their publication in the Government Gazette.

Countersigned by

Field Marshal S. Dhanarajata
Prime Minister

資料 5.2　Chulalongkorn 大学理工学研究機器センター

List of Equipment

1. Scanning Electron Microscope with 2 Channel Wavelength Dispersive X-Ray Spectrometer JEOL Model JSM-35CF
2. Combined Transmission and Scanning Electron Microscope JEOL Model JEM-200CX
3. Devices for Electron Microscope Laboratory
   - 3.1 Ion Sputtering Device JEOL Model JFC-110
   - 3.2 Critical Point Drying Device SAMDRI Model-780
   - 3.3 Vacuum Evaporator JEOL Model JEE-4X
   - 3.4 Ultramicrotome LKB Ultrotome Model V with LKB Knife Maker Model 7800B and LKB Histo Knife Maker Model 2078
4. X-Ray Fluorescence Spectrometer JEOL Model JSX-60PA with Wavelength Dispersive X-Ray Analysis System and Sample Preparation Devices
5. Double Focusing GC/Mass Spectrometer JEOL Model JMS-DX 300/JMA 2000 with 36K Minicomputer, Display Terminal Graphic Printer and Casette Tape Memory
6. High Performance Liquid Chromatograph Shimadzu LC-3A including UV-VIS Spectrometric Detector, Refractive Index Detector, Fluorometric Detector, Gradient Elution Unit, Packed Columns and Recording Data Processor with Thermal Printer
7. Computerized Gas Chromatograph Shimadzu Model GC-RIATFEF with TCD FID ECD and FTD detectors, Thermal Printer Plotter with ^{P} Chromatogram and Processed Data Available on the same sheet.
8. Gas Chromatograph Shimadzu Model GC-7AGPrTF wiht same specifications as GC-RIA but not computerized
9. Atomic Absorption Flame Emission Spectrophotometer, Shimadzu Model AA-650 with Graphite Furnace Atomizer, Arsenic Analyzer, Mercury Vapor Analyzer Hollow Cathode Lamps for the Analysis of Ag Al As Ba Ca Cd Cr Co Cu Fe, Hg K Mg Mn Mo Na Ni Sb Se Si Sn Sr V Zn Zr D_2
10. Vacuum Emission Spectrometer, Shimadzu Vacuum Quantorecorder Model GVM-500
11. Inductively Coupled Plasma ICPS-50 with 1.8 kW Radio Frequency Generator at 27.120 MHz for the Analysis of Liquid Solution Wavelength Range 1800-7850°A.
12. Differential Thermal Analyzer Shimadzu Model DT-30 with Differential Thermal Analysis System. (DTA), Differential Scanning Calorimetry System (DSC), Thermogravimetry Analysis System (TGA) and Evolved Gas Analysis (EGA).
13. Automatic Bomb Calorimeter Shimadzu Model CA-3P Completely Automated with Digital Display and Printer
14. UV-VIS Spectrophotometer Shimadzu Model 240. Wavelength Range: 190-900 nm with Double Beam Photometric System, Direct Ratio Recorder of Thermal Graphic Printer Type with Microcomputer Control.

15. UV-VIS Spectrophotometer Hitachi Model 220. Wavelength Range 190-900 nm with Microcomputer Calculated Ratio Recording.

16. Microflow Spectrophotometer Shimadzu Model CL-720. Wavelength Range : 330 to 900 nm. Flow-thru-Cell : Capacity 33 µl with Thermo electric Temperature Controller.

17. Dual Beam Spectrofluorophotometer Shimadzu Model RF-520 Photometric System : Difference Spectrum Measurement by Dual-Cell System Light Source-Monitoring Dynode Feedback System with Automatic Zero Adjustment. Wavelength Range : 220-700 nm.

18. Infrared Spectrophotometer Shimadzu Model IR-440 Wavelength Range : 5000 cm^{-1} -300 cm^{-1} with Accessories for Sample Preparation.

19. High Speed Thin Layer Chromatograph Scanner Shimadzu Model CS-920 with Fluorescent Attachment and Working Curve Correction by the built in Microcomputer using a correcting program selected out of three. Wavelength Range : 200-630 nm.

20. Particle Size Distribution Analyzer Shimadzu Model RS-1000 Range 0.1-150 µm. with Specific Gravity Balance Method Using Sedimentation in Liquid.

21. Automatic Gamma Counting System for Radioimmunoassay Study Shimadzu Model RAW-300 with Well-Type Scintillation Detector for the Analysis of I-125, Co-57 Cr-51 I-131 and Fe-59.

22. High Temperature High Vacuum Furnace Shimadzu Model VSL Ta 4.5/7 with Programmable Working Temperature up to 2400°C and Furnace Size 45 mm (Ø) x 70 mm (H)

23. Automatic Mooney Viscometer Shimadzu Model SMV-200 with Pneumatic Pressing System and Electric Heating. Measuring Range of Mooney Viscosity : 0-200 M

24. Universal Testing Machine Shimadzu Model DSS-10 T for Reversible Tension and Compression Loading. Capacity from 1 gf-10,000 kgf with XYT-Recorder Twist Test Attachment and High Temperature Furnace (900°C)

25. Amino Acid Analyzer Hitachi Model 835-50 with Microprocessor Controller for automatic analysis using the Single Column Method for both Proteinhydrolysate and Physiological Samples. Automatic Peak Area Integration and Calculation is performed by Microcomputer Control System. Column Size : 2.6 mm I.D. Maximum Sensitivity : 50 picomols. Analysis Time : 1 hr for Proteinhydrolysate Program and 4 hrs for Physiological Program.

26. Ultracentrifuge Hitachi Model 55P-72 with Maximum Speed 55,000 rpm and Maximum Centrifugal Force 393,600 xg.

27. Refrigerated Centrifuge Hitachi Model 20PR-52D with maximum Speed 20,000 rpm and Maximum Centrifugal Force 45,170 xg.

28. CHNO Analyzer Perkin Elmer Model 240 C with Typical Precision of 0.2% on C,S, O and 0.1% on H and N and Analysis Time of Twelve Minutes for simultaneous C, H, N or independent Oxygen or Sulfur.

29. Plasma Reactor YAMATO Model PR-503 with three Reaction Chambers and 500 W output power. Oscillation Frequency 13.56 MHz$\pm$ 0,005% crystal controlled.

資 5. 3

THE NATIONAL LABORATORY ANIMAL CENTRE OF THAILAND (NLAC)

1. BACKGROUND INFORMATIONS

The National Laboratory Animal Centre of Thailand was established in 1972 as a joint project of Chulalongkorn, Kasetsart and Mahidol Universities to fulfil the needs of Laboratory animals for biomedical and other scientific researches in Thailand. Mahidol University accepted the responsibility of setting up the centre at Salaya Campus, Nakorn Pathom province, 25 km away from Bangkok. In 1973 WHO/UNDP assigned Dr. Stian Brichser, The Secretary General of the International Council of Laboratory Animal Science (ICLAS), to advise the architect and the director of the centre on construction design. He also assisted the director setting up the project proposal as well as giving advises on management of the centre. In 1976, the Thai Government accepted the project and has since provided budgets annually for construction cost, equipments, including cages, personnel, consumable supplies, utilities and maintenance. The buildings were completed in late 1979 but the operation did not begin until 1980 due to the lack of autoclave. The first lot of animals, i.e. Wistar rats, arrived from Mollegarrds Breeding Centre Ltd., DENMARK in October 1980, followed by Swiss Albino mice from CLEA Japan Inc. in March 1981.

2. PURPOSES

2.1 To produce animals in sufficient number and of an acceptable hygienic and genetic quality for the users in Thailand.

2.2 To watch the breeding stocks and strains and to do research in laboratory animal science.

2.3 To act as a national information and advisory centre on laboratory animals and laboratory animal science.

2.4 To act as a training centre in laboratory animal technology both on the national and international level.

3. FACILITIES

The facilities to serve the above purposes are provided as followed:-

3.1 The breading facilities

3.1.1 Breeding units (8 - 350) 2,800 m^2: 70%

3.1.2 Washing and sterilizing area

Store (for feed, bedding and shipping boxes) 1,000 m^2: 25%

3.2 The administrative units

Offices	- Director	1 unit
	- Veterinarian	1 unit
	- Secretaries and clerk	2 units
Store room		1 unit
Locker room, toilets		2 units

3.3 Research & training facilities

3.3.1	Laboratory	3 units
3.3.2	Library & seminar room	1 unit

The design and construction of the breeding facilities are based on the principles advised by Dr. Stian Erichsen, the WHO consultant (see appendix I).

4. ADMINISTRATION AND STAFF

The Centre is directly under the responsibility of Mahidol University and is governed by the Board of Directors consisting of representatives from Kasetsart, Chulalongkorn and Mahidol University.

The centre is operated by a director, 1 veterinarian, 3 research scientists, 4 technicians, 1 statistician, 5 office seretaries and clerks, 16 animal caretakers, 4 gardeners, 3 janitors, 2 drivers and 3 guards.

5. CARE AND MANAGEMENT

Care and management of the animal units is conventional but under strict hygienic precautions which will reduce the risk of contamination through different vechicles to a minimum recommended by Dr. Stian Erichsen (see appendix I).

6. ACHIEVEMENTS TO DATE

The NLAC is now capable of producing 3,000 outbred Swiss Albino mice and 800 outbred Wistar rats per week and is about to accommodate guinea pigs, hamsters, gerbils and rabbits. Supplies are available to every institutes in the country.

The NLAC has acted as the national information and advisory centre on laboratory animals and laboratory animal science. Its director is the national member representing Thailand in the International Council for Laboratory Animal Science (ICLAS) and thus in close contact with the development on this field.

It has recently organized a seminar on quality animals for research. The seminar was well attended by 105 representatives from all research institutes in Thailand. This was the first national seminar on laboratory animals in the country and it has motivated understanding on the needs of quality animals for research among the users, the administrate and the suppliers.

7. FUTURE PLAN FOR DEVELOPMENT

Besides introducing more varieties of inbred and non inbred laboratory animals. The followings are the immediate plans, the NLAC will attempt to tackle in the very near future;

7.1 develop laboratories for microbial and genetic monitoring.

7.2 promote research in laboratory animal science.

7.3 find ways and means to provides better services.

7.4 solve existing problems on shortages of experience personnels in the field of laboratory animal science.

A plan to use an adjacent area to the NLAC for a primate unit is also in progress.

資料 5. 4　生　物　製　剤

資 5. 4. 1　輸入生物製剤

1. BCG Vaccine
2. Diphtheria Antitoxin
3. Human Gamma Globulin
4. Hepatitis B Immunoglobulin
5. House Dust Mite Vaccine D Petronyssinus Tyrosine Adsorbed
6. Influenza Vaccine
7. Live Mumps Virus Vaccine
8. Measles Vaccine (Live Attenuated)
9. Measles Immunoglobulin, Human
10. Meningococcal Vaccine
11. Mixed Gas-gangrene Antitoxin
12. Pertussis Immune Globulin
13. Pertusis Vaccine
14. Poliomyelitis Vaccine (Inactivated)
15. Poliomyelitis Vaccine (Oral, Live, Savin Vaccine)
16. Pnu-Imune (14 types of Pneumococcal Polysaecharides)
17. Rho (D) Immune Globulin (Human)
18. Rabies Vaccine (Tissue culture vaccine)
19. Rabies Antiserum
20. Human Rabies Immunoglobulin (HRIG)
21. Reptilase
22. Rubella Vaccine (Live Attenuated)
23. Type of Streptococcus Pneumoniae (Pneumovax)
24. Tetanus Antitoxin
25. Tetanus Vaccine (Tetanus Toxoid)
26. Tetanus Immunoglobulin (Human Antitetanus Immunoglobulin)
27. Yellow Fever Vaccine
28. Vivotil Berna
29. Diphtheria and Tetanus Toxoids
30. Adsorbed Tetanus and Diphtheria Toxoids
31. Diphtheria, Tetanus, and Pertussis Vaccine
32. Adsorbed Diphtheria, Tetanus and Pertussis Vaccine
33. Diphtheria, Tetanus, Pertussis, and Poliomyelitis Vaccine

34. Measles and Rubella Vaccine (Live Attenuated)
35. Mumps and Rubella Vaccine (Live Attenuated)
36. Measles, Mumps, and Rubella Vaccine (Live Attenuated)
37. Antigen Mixture of Bacteria
38. Tuberculin

資 5.4.2 タイ国薬局方記載生物製剤

1. Active immunizing agent

Bacterial Vaccines

1) BCG vaccine, Freeze-dried
2) Cholera vaccine
3) Pertussis vaccine, adsorbed
4) Typhoid vaccine

Toxoids

5) Diphtheria toxoid, adsorbed
6) Tetanus toxoid, adsorbed

Multiple Antigen Preparations

7) Diphtheria and Tetanus toxoids, adsorbed (DT)
8) Tetanus toxoid and Diphtheria toxoid, adsorbed (dT_s for adult use)
9) Diphtheria, Pertussis, and Tetanus vaccines, adsorbed (DPT)
10) Diphtheria, Pertussis, Tetanus and Poliomyelitis vaccine, killed

Viral Vaccine

11) Influenza vaccine, in-activated

12) Influenza vaccine, in-activated (surface antigen)

13) Influenza vaccine, live (intranasal)

14) Japanese encephalitis vaccine

15) Measles vaccine, live

16) Measles and Mumps vaccine, live

17) Measles, Mumps, and Rubella vaccine, live

18) Measles and Rubella vaccine, live

19) Mumps vaccine, live

20) Poliomyelitis vaccine, in-activated

21) Poliomyelitis vaccine, oral

22) Rabies vaccine

23) Rubella vaccine, live

24) Rubella and Mumps vaccine, live

25) Smallpox vaccine, freeze-dried

26) Yellow fever vaccine

2. Passive immunizing agent

Antitoxin

1) Diphtheria antitoxin

2) Gas-gangrene antitoxin (Oedematiens)

3) Gas-gangrene antitoxin (perfringens)

4) Gas-gangrene antitoxin (vibrion septique)

5) Mixed Gas-gangrene antitoxin

6) Tetanus antitoxin

Antiserum

7) Antirabies serum

Antivenin

8) Banded Krait antivenin

9) Naja antivenin

10) Malayan pitviper antivenin

11) Green pitviper antivenin

12) Russell's viper antivenin

Immune globulines

13) Immuneglobulin

14) Hepatitis B immuneglobulin

15) Pertussis immuneglobulin

16) Rabies immuneglobulin

17) Tetanus immuneglobulin

3. Blood products

1) Albumin, Human

2) Antihaemophilic factor

3) Cryoprecipitated antihaemophilic factor

4) Factor IX complex

5) Anticoagulant citrate dextrose solution

6) Anticoagulant citrate phosphate dextrose solution

7) Plasma protein fraction

8) Red blood cells

9) Whole blood

10) Anti-D (Rho) immunoglobulin injection

11) Platelet concentrate

資料 5.5 環 境 衛 生 問 題

Extendable information (Environmental Health Science)

A. Whether there are many cases of diseases caused by environmental toxic substances?

1. Environmental castor bean dust exposure to cause respiratory diseases.
2. Environmental pesticide exposure to result epidemiological diseases.
3. Environmental heavy metal exposure to result health hazards.
4. Miscellaneous environmental poisons to cause diseases.

B. Whether many toxic substances are found in Thailand which may cause human (or animal) diseases?

1. Dye in cosmetic
2. Trichothecines
3. Toxic Mussel
4. Environmental toxic substances that may cause Reye's syndrome.

C. Reported Cases of Poisons in 1983 (Division of Epidemiology)

A. Cases of diseases caused by environmental toxic substances.

1. Castor bean dust exposure to cause respiratory diseases

There was outbreak of illness during October 1977-April 1980 in Samutprakarn province. About 50-60 patients were admitted at Samutprakarn, Pinklao, Kan Tarua, Romatibodi and Chulalongkorn hospitals because of respiratory diseases. The diseases reported were malaise, dyspnea, headache, cough and asthma. The patients were residents living near the Thai Castor Oil Industries Co.,Ltd. at Samutprakarn provinces or its employee. The illnesses attributed to castor pomace which was finely pulverized pomace of dry, light and easily dispersed by slight air flowing to the surrounded area.

The castor pomace contained environmental toxic substances called Ricin. Ricin is the major toxicomponent of castor pomace. It is an albumin of which lethal doses produce nausea, vomiting diarrhoea, tenemus, abdominal cramps, and hemorrhagic changes in the gastro-intestinal tract, ricin produces intense eye irritation also. The allergenicity found in industrial exposure of Ricin are those of allergic conjunctivitis, rhinitis and asthma. Itching and tearing of the eyes, nasal itching and discharge, paroxysmal sneezing and tightness of the chest and wheezing (which in severe cases proceed to status asthmaticus).

Remark 1) There have been a few cases of illness reported after April 1980 since the government authorities were stricted to the pomace control of the castor oil factories. Therefore the dust treatment system and waste water treatment were improved by the factory.

2) Besides the community illness occurred in the certain area around the castor oil factory, occupational illness due to the highly toxic and allergenic nature of the castor bean are likely to occur in the areas where this plant is either a native and commercial crop. In the growing, harvesting, transporting, and commercial processing of the beans, whenever they have been handled in quantity, serious and incapacitating reactions have occurred in some of the individuals engaged in the daily operations of production and processing. Therefore this environmental toxic substance should be taken into attention for public health.

References

- Official correspondence of Department of Medical Sciences, Department of Industrial Works, Department of Health, Pinklao Hospital, Samutprakarn Hospital, Kan Tarua Hospital, Department

of Science Service, Office of the Permanent Secretary, Office of the Secretary to the Minister, Thai Castor Oil Industries Co.,Ltd.

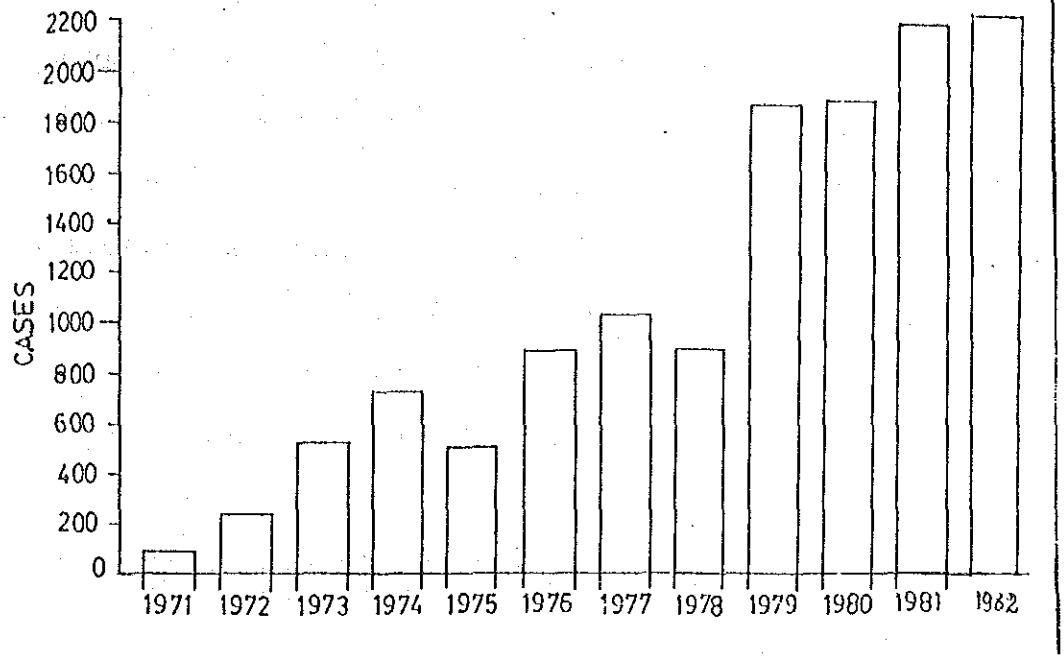
- Information from official meeting between representatives from Department of Medical Sciences (Director of Toxicology Division), Department of Industrial Works, Department of Health, executives from Thai Castor Oil Industries Co.,Ltd. and some other representatives from other government authorities.
- Personal Communications with the office of Samutprakarn Provincial Health, Division of Occupational Health, the Office of Provincial Factory, castor pomace intoxicated patients in the Pinklao and Samutprakarn Hospitals during the epidermic toxicity.

2. Environmental Pesticide exposure to result epidemiological disease

The diseases caused by pesticides occur in Thailand and they are usually the result of occupational exposures, of careless use, misuse or mishandling the pesticides. There have been reports of illness and fatalities resulting from insecticide and herbicide exposure in Thailand.

PESTICIDE POISONING

- Reported cases by year, Thailand, 1971-1981



Some striking pesticide poisoning cases in Thailand

a. Methomyl (carbamate insecticide) poisoning There were epidemiological reports of methomyl poisoning cases in various parts of the country, occuring from accidental exposure and some misuse purpose. In 1981 There were 258 methomyl poisoning cases and 3 were dead in Pitsanulok, Bangkok and Chiengmai provinces, all were resulted from methomyl contamination in food. In 1982, also 53 methomyl poisoning cases were reported. In 1983, Toxicology Division Department of Medical Sciences had found 15 specimens containing of methomyl. During Jan.-July 1984, 78 methomyl cases and 5 were dead in Supanburi, Nongkai and Surathani provinces. This substance is mostly white crystalline powder like sugar, little smell and easily soluble in water. The physical properties makes it easier to be contaminated in food in case of accidental contamination.

b. Other pesticide poisoning cases

There have been some reports of other commonly used pesticides for example; the organophosphates parathion, methyl parathion and the

herbicide grammoxone. There were epidemiological reports of the pesticide poisoning cases in 1981, parathion 60 cases, methyl parathion 34 cases and grammoxone 76 cases. In 1982, there were 115 parathion poisoning cases, 33 methyl parathion cases and 11 grammoxone poisoning cases.

The organophosphates and carbamates are mostly involved in human poisoning. Therefore it will be valuable to study them in blood levels relating to red blood cell and serum cholinesterase values coupled with insecticide clinical symptoms. The study will be useful to determine the exposure and to assist physician's diagnosis. It will be also valuable as an index for warning exposure hazards to the agriculturers and people to prevent possible severe toxic symptoms from the continuous exposure.

References

(1) Public Health Statistics 1977-1981 Division of Health Statistics, Office of the Permanent Secretary, Ministry of Public Health. p.210-212

(2) Annual Summary Epidemiological Report 1981, Ministry of Public Health p.85-94, 157-160

(3) Weekly Epidemiological Surveillance Report, Ministry of Public Health Vol.15, No.43, Nov.2,1984 p.561-564

(4) Annual Summary Epidemiological Report 1982, Ministry of Public Health p.95-100

(5) Official analytical reports of Toxicology Division and Department of Medical Sciences Regional Centres.

3. Environmental heavy metal exposure to result health hazards

Heavy metals exposure creates problems to public health. The problems increases in maguitude with increasing urbanization, industrialization and technologic development. The diseases related to pollution of the environment

from industrial contaminants were recognized in Thailand.

The report of environmental exposure; lead is more significant than other heavy metals. The high concentration resulted from heavy automobile traffic and high use of lead in industry. The concentration of lead in normal atmosphere and urban area of Bangkok were reported to be 0.0005 and 0.75 consecutively. In industrial area of Samutpakarn province of Thailand the lead cencentration were reported to be0.0089-1.516 microgram per cubicmetre during 1982-1983. Lead is important environmental poison which may cause serious toxic effects result from its effects in brain and peripheral nervous system.

There have been no number survillance report of total patients in Thailand who occupationally exposed to lead. However a number of industrial and mining workers whose health were checked by physicians to diagnose the lead poisoning and their reports are as follows:

Year	Working place	Number of workers whose health were checked	Workers whose lead poisoning symptoms appear	
			Number	%
1979	Factories	197	122	61.93
	Mines	66	6	9.09
	Total	263	128	48.67
1980	Factories	246	17	6.91
	Mines	-		
	Total	-		
1981	Factories	93	51	54.84
	Mines	191	100	52.36
	Total	284	151	53.17
1982	Factories	54	27	50
	Mines	174	93	53.45
	Total	228	110	48.25
1983	Factories	300	159	53
	Mines	36	12	53.33
	Total	336	171	50.89

Apart from occupational exposure to lead, there was an outbreak of community illness result from unused lead battery pots as domestic fuel. A numberous district people has the lead poisoning hazards.

Occupational workers are now aware of poisoning from lead as well as other hazardous heavy metals (e.g. mercury, manganese and copper) and

very interested in having their blood levels determined. Toxicology Division have been absolutely determined the heavy metal levels in specimens e.g. blood, urine from the workers as in the following analytical reports:

Cases \ Year	1982	1983	1984
Total number of cases sent for heavy metal determination	239	165	91
Cases of Abnormal heavy metal levels	40	61	30

We are interested in determining the blood heavy metal levels in patients whose lead poisoning symptoms just appear for an average index to warn the hazard expasure for Thai people. Other heavy metals which have not been mentioned such cadmium, we are also interested in their determination related to clinical toxic symptoms but more analytical skill in this research field is needed.

References

1. Thailand Journal of Health and Environment. Vot.2 No.7 May-Aug.1984 p.19-30
2. Public Health Statistics 1979-1981. Division of Health Statistics. Office of the Permanent Secretary, Ministry of Public Health p.212
3. Official analytical reports of Toxicology Division, Department of Medical Sciences.

4. Miscellaneous environmental poisons

4.1 Methyl alcohol There were outbreak of illness from time to time during 1955-1975 and about 200 patients were admitted at the regional hospitals in Nakornnayok, Lopburi, Nakornpatom and Pattani provinces. Methyl alcohol was used to dilute with water because of misunderstandin or misuse that it can replace ethyl alcohol then resulted in the outbreak illness and death often in the community meetings.

4.2 Globe fish (Fugu) and King's crab egg. There were illness from the toxicity of Fugu and King's crab egg in Thailand. Thus were known of

toxin namely tetrodotoxin,natural toxic substances in some organs of the Fugu fish and if lack of knowledge to remove out it means death after ingestion. The King crab egg also expected that containing nitrogenous toxic substances which caused neurotoxicity to the victim consumers until now no elucidation of toxic substances.

4.3 Nitrite There were outbreak of illness in 1980 from nitrite contamination in food and about 50 sick people were admitted to Prospital in Pichit province. Nitrite is chemical fertilizer like as white sugar and carelessly contaminated in a food in a restaurant. There were two dead victims because of hematotoxicity.

B. Toxic substances which are found in Thailand and may cause human (or animal) diseases.

1. Dyes in cosmetic Short term carcinogenicity study of lipstick dye were reported by National Cancer Institute of Thailand that 15 from 20 lipstick samples shown of positive Ames test. The furthur study is carcinogenic evaluation of the lipstick and other cosmetic products with animal test.

Reference Detection & identification of Mutagens in Lipsticks; W. Rojanapo and S chutimataewin Research Division, National Cancer institute, Bangkok Thailand : Presented in part at the 3rd international Conferences on Enviromental Mutagens, Tokyo, Japan, September 21-27, 1981.

2. Trichothecenes Claimed chemical warfare,these toxins produced by Fusarium fungi celled trichothecines, It is very hazardous toxic substances to man and animal since it cause severe gastrointestinal disorder, hematotoxicity, neurotoxicity and abortion. Some unknown pathologic trichothecine like symptoms in animal were studied first, owing to the contaminated, toxic substance in animal food produced by the jungi. These toxins were refered to be dangerous and killed

many hundred lives in Lao during War in Indo China (More Japanese in biology are keen in this and we are eager to study)

Reference Official Newsletter of The Toxicalogical Society of Thailand Vol.2, No.2 Sept. 1984.

3. Toxic mussel There were toxic mussels which cause paralytic shellfish poisoning to consumers in Prachaubkirikan province. There were about 63 cases of disease and the cause of toxic mussel accurred at the outbreak illness are from overgrowth plankton which was mussel food at the time. Some environmental poisons are suspected to cause the overgrowth plankton.

Reference 1. Piyakan, T and Tamiyawanich, S. Red Tide Phenomena in Upper Part of Thai Gulf, Fish Disease Journal 1979, 4, p.208-215.

2. Epidemiological Surveillance Report Vol.14, No.31 Aug.5,1983, p.380

4. Environmental toxic substances that may cause Reye's syndrome

There were many patients especially the northeast people of Thailand who had Reye's syndrome. The disease was suspected to be caused by salicylates, and pesticides. Salicylates are widely used drug among Thai people, and pesticides are widely used in various aspects. The real cause and more research knowledge in this field is still unexplored

References 1. Association between salicylates and Reye's syndrome (letter) Soller RW, et al. JAMA 1983 Feb.18;249(7):883-4

2. The aspirin/Reye's syndrome link (letter) Bianchine JR, et al. Lancet 1982 Dec.11;2(8311):1333

3. Reye's syndrome: twenty years in perspective. Riela AR. et al. NC Med J 1983 Jun;44(6):351-5 (55 ref.)

4. Personal communications with physicians in Rajawithi hospital Bangkok.

C. Reported cases of Poisons in 1983 by provinces

Division of Epidemiology

Office of the Permanent secretary for Public Health

Ministry of Public Health

	Cases	Deaths
- insecticide poisoning	2,353	17
- accidental poisoning by petroleum products	2	-
- accidental poisoning by other poisons	16	-
- suicide by liquid substance poisoning and drugs	92	8

(Recent report from January to 2 November 1984)

- insecticide poisoning (Central, Northern, North East, & Southern)	1,574

資　料　6

タイ国大学関係資料

資料 6. 1.　大学における感染症関連研究

資料 6. 2.　大学病院の検査

資料 6. 3.　急性下痢症の研究

資料 6. 4.　狂犬病情報

1. FACTORS CONTRIBUTING TO THE DEVELOPMENT OF CEREBRAL MALARIA

I. Humoral Immune Responses*

SAVANAT THARAVANIJ,† M. J. WARRELL,‡ SURANG TANTIVANICH,†
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Abstract. Humoral immune responses to malaria were studied in 100 patients with cerebral malaria of whom 53 had added complications, 108 patients with acute malaria, and 100 blood donors. The methods employed were indirect hemagglutination (IHA), indirect fluorescent antibody (IFA), enzyme-linked immunosorbent assay (ELISA), and parasite growth inhibition (PGI) tests. Patients with cerebral malaria, especially those with complications, had histories of fewer attacks of malaria in the previous 5 years than did those with acute malaria, suggesting that the cerebral malaria patients were less immune. The combined cerebral malaria group (complicated and uncomplicated) did not show defective humoral immune responses, since the initial seronegative rate and the mean initial IHA and IFA antibody titers were not significantly different from those of acute malaria patients and the mean initial ELISA titer was even higher than that of the acute malaria group. Reduced humoral responses were found only in complicated cerebral malaria patients, as their mean initial IHA titer was lower and their IHA seronegative rate was higher than those in acute malaria patients and in the uncomplicated cerebral malaria group. The combined cerebral malaria group had greater PGI activity than that of acute malaria patients, but this increased activity was entirely due to the higher results obtained in the complicated cerebral malaria group. The increased PGI activity returned to normal after recovery. An IgG preparation from seven of eight of these sera failed to exert the growth inhibition effect. Factors other than IgG were therefore responsible for the inhibition of parasite growth. *Am. J. Trop. Med. Hyg.*, 33(1), 1984, pp. 1–11

2. FACTOR CONTRIBUTING TO THE DEVELOPMENT OF CEREBRAL MALARIA II ENDOTOXIN

Usawattanakul, W., Tharavanij, S., Warrell,M.J., Looareesuwan, S., Vongsthongsri,U., and Supavej, S.

Department of Microbiology and Immunology, Faculty of Tropical Medicine, Mahidol University

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ABSTRACT

Limulus lysate test (LLT) was used to detect endotoxin in the plasma of 8 patients with cerebral malaria, 15 patients with acute malaria and 15 healthy controls. It was found that 7 patients with cerebral malaria (87.5%) were LLT positive whereas only 3 acute malaria patients (20%) were positive and all healthy controls were negative. Hemocultures for aerobic and anaerobic bacterial pathogens in all cases were negative. In the follow-up, it was found that LLT in cerebral malaria patients remained positive for 1-3 days after treatment, and all became negative at the time of discharge from the hospital.

This investigation received the financial support of the UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases in Co-operation with the Wellcome-Oxford University-Tropical Medicine Research Programme.

3. THE CAUSE OF RETINAL HAEMORRHAGES IN CEREBRAL MALARIA

Pornthep Chanthavanich, Sornchai Looareesuwan*, David A. Warrell*, Nicholas J. White*, Sathien Chantaratherakitti**, Sucheep Changswek**, Lertrit Chongmankongcheep* and Charimet Kanchanaranya**

Department of Tropical Pediatrics, *Department of Clinical Tropical Medicine and Hospital for Tropical Diseases, Faculty of Tropical Medicine and **Department of Ophthalmology, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

ABSTRACT

A group of 150 patients with strictly-defined cerebral malaria were studied in Chantaburi. In 144 of these the retinae could be adequately examined : retinal haemorrhages were seen in 21 patients (14.6%) and were photographed in three cases. Haemorrhages were multiple in 17 cases and bilateral in 14 : there was subhyaloid extension in two. Soft exudates were seen in two, the retinae were considered oedematous in four (in one of these there was bilateral papilloedema).

Comparison of the groups with and without retinal haemorrhages showed that they were associated with several indices of severity such as high parasitaemia, schizontaemia and elevated serum creatinine. Although there was a highly significant association between anaemia and retinal haemorrhages, not all patients with retinal haemorrhages were severely anaemic.

It is suggested that retinal haemorrhages, a frequent finding in cerebral malaria, may be visible evidence of vascular lesions involved in the pathogenesis of this condition.

Wellcome-Mahidol University, Oxford Tropical Medicine Research Programme financed by "The Wellcome Trust of Great Britain".

4. Enzyme typing of some isolates of *Plasmodium falciparum* from Thailand

S. THAITHONG[1], T. SUEBLINWONG[2] AND G. H. BEALE[3]

[1]*Dept. of Biology, Faculty of Science, Chulalongkorn University, Bangkok, Thailand*
[2]*Dept. of Biochemistry, Faculty of Medical Science, Chulalongkorn University, Bangkok, Thailand*
[3]*Institute of Animal Genetics, Edinburgh EH9 3JN, Scotland, U.K.*

TRANSACTIONS OF THE ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, VOL. 75, NO. 2, 1981

Summary

One hundred and eighty nine isolates of *Plasmodium falciparum* collected in Thailand, and eleven originating from Cambodia, have been typed by starch-gel electrophoresis of six enzymes (GPI, LDH, GDH, PGD, ADA, PEPE). Substantial polymorphism was found only with GPI. Occasional variants occurred with ADA, while the other four enzymes appeared to be invariant by the tests used. The results are compared with those of similar studies on African isolates, and lead to the provisional conclusion that *P. falciparum* isolates from different different endemic areas constitute a single, world wide species, containing potentially interbreeding individual organisms.

5. SUSCEPTIBILITY OF *IN VITRO* CULTURED *PLASMODIUM FALCIPARUM* TO CHLOROQUINE AND COMBINATIONS OF SULFADOXINE AND PYRIMETHAMINE

BOONYIAM KEITTIVUTI, ANGOON KEITTIVUTI and PANITHA PANICHACHEEWAKUL

Department of Parasitology, Faculty of Public Health, Mahidol University, Bangkok, Thailand

(*Received* 25 *November* 1980; *in revised form* 9 *December* 1981)

Abstract—KEITTIVUTI B., KEITTIVUTI A. and PANICHACHEEWAKUL P. 1982. Susceptibility of *in vitro* cultured *Plasmodium falciparum* to chloroquine and combinations of sulfadoxine and pyrimethamine. *International Journal for Parasitology* 12: 383–387. The culture of *P. falciparum* in RPMI 1640 media *in vitro* was used for testing antimalarial drugs on blood from 11 patients at the Malaria Eradication Center, Phabuddhabat District, Saraburi Province, Thailand. Chloroquine in concentrations of 1, 3 and 4 nmol, combinations of sulfadoxine and pyrimethamine at 0·05 mg + 2·5 μg, 0·10 mg + 5 μg and 0·20 mg + 10 μg respectively and 1·4 μg sodium hydroxide/ml of blood were used. The organisms in the culture were resistant to the action of the combinations of sulfadoxine and pyrimethamine but were susceptible to chloroquine particularly at the 3 and 4 nmol levels. The *in vitro* test system used offers a valuable tool for studying the activity of antimalarial drugs.

International J. Parasitology, 12(5), 883-387, 1982

6. Resistance of ten Thai isolates of *Plasmodium falciparum* to chloroquine and pyrimethamine by *in vitro* tests

S. THAITHONG[1] AND G. H. BEALE[2]

[1]*Dept. of Biology, Faculty of Science, Chulalongkorn University, Bangkok, Thailand*
[2]*Institute of Animal Genetics, Edinburgh EH9 3JN Scotland, U.K.*

Summary

In vitro drug resistance tests of ten isolates of *Plasmodium falciparum* from three different collection points in Central Thailand have been carried out, and the results compared with those of similar tests with a drug-sensitive West African isolate. Judged by concentration of drug tolerated, the Thai isolates appeared to be about 10 times as resistant to chloroquine, and usually about 10^5 times as resistant to pyrimethamine, as the African isolate. A little variation amonst the Thai isolates was detected.

7. DEVELOPMENT OF ATTENUATED VACCINES FOR DENGUE 1-4

Natth Bhamarapravati, Sutee Yoksan and Scott B. Halstead*

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Mahidol University, Bangkok, Thailand

ABSTRACT

Selection of a variant of dengue virus created by serial passage in non human primary cell cultures suitable for use in man is continuing on.

Status of vaccine development (as of 31 December, 1982).

Dengue 1,2 and 4: Both dengue 1(16007) and dengue 4(1036) were at 40th passages in primary dog kidney (PDK). Dengue 2(16681) was at 50th PDK passage. All viruses formed uniformly small plaque on LLC-MK2 cells, failed to grow in human monocytes, failed to grow in LLC-MK2 cells at 39.0°C and did not produce viremia but did evoke an antibody response in susceptible rhesus monkeys.

Evidences suggested these three strains were attenuated for primates. At present, master seeds, production seeds and candidate vaccines for dengue 1, dengue 2, and dengue 4 are on preparations.

Dengue 3(16562) was at 50th passage in African green monkey kidney cells. Repeated efforts to adapt dengue 3 to PDK have failed. Passage of this virus still has to continue in African green monkey kidney cells. Dengue 3 virus exibited uniformly small size plaques in LLC-MK2 as compared with the large plaque of the parental virus. It did not produce cytopathic effect in this kind of cell and did not replicate in human monocytes.

Supported by World Health Organization

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8. ELECTRON MICROSCOPIC STUDIES ON REPLICATION OF DENGUE-2 (16681) PARENTAL AND VACCINE STRAIN IN PDK CELLS

Siriporn Sriurairatna, Sutee Yoksan,
Panthep Ratanakorn, Natth Bhamarapravati.
Department of Patholcgy, Faculty of Medicine,
Ramathibodi Hospital, Mahidol University,
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ABSTRACT

Replication of dengue-2 (16681) parental and vaccine strain (PDK 53) in primary dog kidney cells were studied by electron microscopy. The two strains produced the same pathologic changes in the cell cytoplasm at acatterred areas. There were replication of the virus in cisternae of rough endoplasmic reticulum (RER) and formation of cytopathic vesicles in the near-by cisternae of the RER. Sometimes both the virus particles and the cytopathic vesicles were present in a single distended cisterna. Virus particles of the two strains are of the same morphology. The attenuated strain has lower infectivity at time intervals compared to the parental strain and gives a lower virus yield in cell culture. Morphology of dengue viruses in PDK cells will be compared with the viruses in other cell systems.

Presented in International Conference on Dengue/Dengue Haemorrhagic Fever. Kuala Lumpur, Malaysia. Sep. 1-3, 1983.

9. STUDY ON IMMUNE RESPONSES TO TYPHOID VACCINES IN HUMAN: SIX MONTHS RESULTS

Suttipant Sarasombath*, Tusanee Sukosol*,
Benjawan Rungpitarangsi**, Boonyuan Dumavibhat†,
Pattama Puksirikul*, Sunee Korpsriset*.

*Department of Microbiology, **Department of Pathology,
†Department of Preventive and Social Medicine,
Faculty of Medicine, Siriraj Hospital
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ABSTRACT

The cell-mediated immune response (CMIR) to lipopolysaccharide (LPS) and protein (Barber's protein, BP) antigen of *S. typhi*, the specific antibody response to O and H antigens of *S. typhi* were investigated in 29 human volunteers before and during 24 weeks after vaccination with oral attenuated *S. typhi* Ty21a strain vaccine (CO), acetone-inactivated (CA) and heat-phenol-inactivated (CH) *S. typhi* Ty2 vaccines. The employed methods were leukocyte migration inhibition agarose technique for the CMIR and standard Widal agglutination for the specific antibodies response.

The results indicated that all 3 vaccines could stimulate CMIR in volunteers. The CMIR to LPS antigen disappeared before 24 weeks after vaccinations while significant CMIR to BP antigen still persisted at the 24th week. The CO group showed earliest CMIR during the 1st week after vaccination to protein antigen of *S. typhi* which was believed to be a protective antigen but almost had no specific antibody response to *S. typhi*, while the CH group had the latest CMIR but showed the best specific antibody response. The CA group showed later CMIR than CO group but faster than CH group and the specific antibody response was

almost comparable to CH group. Since there were evidences that the anti-O and anti-H antibodies have no role in protection against typhoid fever and CMIR may be relevant in protection, these results possibly suggest the earliest protective effect of oral attenuated *S. typhi* Ty21a strain vaccine.

Supported by W.H.O. (T10/181/19, I.D. 81071).

10. APPLICATION OF MONOCLONAL ANTIBODY TO CHLAMYDIA TRACHOMATIS IN LABORATORY DIAGNOSIS

Sontana Siritantikorn* Chantapong Wasi* Pilaipan Puthavathana*
Prapas Bhiraleus** Anek Bedavanij*** Puan Suthithampinij****
Prasert Thongcharoen* Raweewan Kangtang*

Department of Microbiology*, Department of Obstetrics and Gynaecology**, Department of Opthalmology***, Department of Medicine****, Siriraj Hospital, Bangkok 10700 Thailand

During May to July 1983, the sensitivity of commercial fluorescein conjugated monoclonal antibody to all serotypes of C. trachomatis has been evaluated by comparing to the conventional Giemsa and iodine staining mothods. The specimens were taken from 8 case of chronic collicular conjunctivitis, 2 case of neonatal conjunctivitis, 34 case of nonspecific vaginitis and 1 case of Reiter's syndrome. Giemsa staining and flourecent antibody technique (FA) were performed in direct cell smears from appropriated clinical specimens. Isolation of C. trachomatis in McCoy cell culture treated with cycloheximide were studied parallelly, using the FA and iodine staining for identification.

From direct clinical specimens, all smears were negative by Giemsa and FA except one case of trachoma was positive by FA. For cell culture isolation, in nonspecific veginitis, 26 percent could be dectected by FA, while iodine staining could pick up only 15 percent. One case of Reiter's syndrome and one of two neonatal conjunctivitis case were positive in cell culture by FA but negative by iodine staining.

In cell culture detection, the fluorescent antibody technique was superior to iodine staining in sensitivity and specificity. However, the value of FA in direct clinical specimen examination needs further investigation.

Supported by Mahidol University Research Grant

11. MONOCLONAL ANTIBODIES STUDY ON RABIES VIRUS ANTIGENS IN THAILAND

Prasert Thongcharoen[1], Pierre Sureau[3], Chantapong Wasi[1]
Pilaipan Puthavathana[1], Lersuang Chavanich[2]

1. Department of Microbiology, Faculty of Medicine
Siriraj Hospital
2. Department of Clinical Microbiology, Faculty of
Medical Technology, Mahidol University
Bangkok, Thailand
3. Centre Antirabique, Institut Pasteur, Paris, France

ABSTRACT

Seventy seven original dog brain specimens containing rabies virus were collected from several laborateries in Bangkok. Antigenic analysis was performed by the indirect FA technique using a panel of twenty hybridoma monoclonal antibodies. Thai antigenic determinants were apparently different from isolates obtained from other Asian countries and could be seperated into three subgroups. Fifty four strains were designated as Asian type 7, fifteen strains as Asian type 8 and eight strains as Asian type 9.

J Med Ass Thailand 1982; 65 : 439-442.

12. AN ECONOMICAL REGIMEN OF HUMAN DIPLOID CELL STRAIN ANTI-RABIES VACCINE FOR POST-EXPOSURE PROPHYLAXIS

M.J.Warrell, D.A.Warrell, Pravan Suntharasamai, Chaisin Viravan,
*Abha Sinhaseni, *Dusit Udomsakdi, *Rod Phanfung, **C.Xueref,
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Dept.of Clinical Tropical Medicine and Hospital for Tropical Diseases, Faculty of Tropical Medicine, Mahidol University
*Thai Red Cross Society
**Memorial Institute
***MRC Clinical Research Centre.

ABSTRACT

Vaccine regimens using 0.1 ml human diploid cell strain vaccine (HDCSV) given intradermally (id) in single and multiple sites, or with

aluminium hydroxide adjuvant given subcutaneously (sc),were compared with the regimens of HDCSV and Semple vaccine currently suggested by WHO. Some groups were also given human rabies-immune globulin (HRIG). Neutralising antibody titres were monitored for 3 months. Antibody was detected earliest in subjects given 0.1 ml HDCSV id at each of eight sites. The highest antibody titres from day 14 onwards were found after intramuscular (im) administration of HDCSV,but the multiple-site id regimen, which requires only one quarter of the volume of vaccine required for the im regimen, gave similar results, provided that a booster was given on day 91. This finding suggests that a treatment schedule based on this regimen would be suitable for post-exposure prophylaxis. Adjuvanted vaccine gave similar results to the same amount of antigen given id. Semple vaccine produced the lowest titres. HRIG,given at the high dose of 40 IU per kg,suppressed the antibody response to some of the regimens.

Published in The Lancet,August 6,1983.
Wellcome-Mahidol University, Oxford Tropical Medicine Research Programme supported by "The Wellcome Trust of Great Britain"
Presented at the Annual Meeting of the Faculty of Tropical Medicine, 1 July, 1982.

13. NONFATAL RABIES IN DOGS AND OTHER MAMMALS. IS IT USUAL?*

Samrerng Ratanarapee, Chantapong Wasi,** Lersuang Chavanich,***
Pilaipan Puthavathana,** Kharb Chattuchai,****
and Prasert Thongcharoen**

Department of Pathology, Faculty of Medicine Siriraj Hospital,
Mahidol University, Bangkok 10700, Thailand.

ABSTRACT

From September 1978 to December 1980, specimens from 400 healthy dogs, captured from various places around Bangkok and its vicinity, were studied. These dogs were sacrificed after 3 day's observation. No evidence of past rabies infection was found in this group. In comparison, rabies positive specimens were found in 4 of 32 dogs which died spontaneously within the observation period. Rabies suspected specimens from another 147 mammals including humans, dogs, cats, rats and a gibbon were studied and

39 per cent of them were positive. The authors concluded that if natural nonfatal rabies infection does occur in dogs, it is extremely rare. It was not detected in our present study.

Published in J Med Ass Thailand 1982; 65:33-37.

* Supported by The Joint Siriraj-China Medical Board's Grant No. 75-348.

** Department of Microbiology, Faculty of Medicine, Siriraj Hospital.

*** Department of Microbiology, Faculty of Medical Technology.

**** Divison of Rabies Control, Bangkok Metropolitan, Bangkok, Thailand.

14. EXAMINATION OF THE YELLOW SPOT SAMPLES COLLECTED FROM THAILAND BORDER CLOSE TO CAMBODIA

Samaniya Sukroongreung[1], Sompool Kritalugsana[2], Chuliratana Nilakul[1], Kleophant Thakerngpol[2], Pithaya Viriyanondha[3],

1 Faculty of Medical Technology, Mahidol University,

2 Faculty of Medicine and Siriraj Hospital, and

3 Armed Forces Institute of Medical Sciences .

ABSTRACT

The yellow spot samples collected from Thailand border eight kilometers close to Cambodia mostly consisted of pollen of the Compositae from so far unidentified sources. The other components of the spots were fungal elements. A toxic fungus, Fusarium semitectum var. semitectum, was isolated from two of twenty-two spots. The crude extract of this fungus grown on corn seed at 25-30°C killed experimental mice. Therefore the possible producers of trichothecene mycotoxins exist in Thailand either they are in nature or they were mixed together with pollen of unknown sources.

Published in Siriraj Hospital Gazette 34 : 643, 1982.

資料 6.2 Siriraj Hospital 検査項目

(Department of Microbiology)

Virus laboratory services

I. Rapid diagnosis

(Service)

Organism	Test perform	Specimen	Service charge/B per serum
Chlamydia trachomatis	Giemsa & FA*	Conjunctival scrape	100
Herpes simplex	Giemsa & FA*	Lesion scrape	100
Rabies	FA*	Brain** Corneal touch	50
Rotavirus	ELISA***	Stool	100
Varicella-Zoster	Giemsa	Lesion scrape	50

* FA: Fluorescent antibody

** Brain from animal or autopsy case

*** ELISA: Enzyme labeled immunosorbent assay

II. Serology

Organism	Test perform	Specimen	Service charge/B per serum
Mycoplasma pneumoniae	CF[1]/PHA[2]	Paired sera*	50
Toxoplasma gondii	PHA	Paired sera	50
Rubella	HAI[3]	Paired sera	50
Rubella IgM	SPIHAD[4]	Paired sera	150
Herpes simplex	CF	Paired sera	50
Cytomegalovirus	CF	Paired sera	50
Varicella-Zoster	CF/IAHA[5]	Paired sera	50
Epstein-Barr Virus	FA	Paired sera	100
Measles	CF	Paired sera	50
Mumps	CF	Paired sera	50

Organism	Test perform	Specimen	Service charge/B per serum
Dengue	HAI	Paired sera	50
Chikungunya	HAI	Paired sera	50
Japanese encephalitis	HAI	Paired sera	50
Adenovirus	CF	Paired sera	50
Influenza	HAI	Paired sera	50
Polio	NT	Paired sera	100
Coxsackie B	NT	Paired sera	100
Rabies	NT[6]	Serum after vaccination	200
Anti HAV IgM	ELISA	Single convalescent serum	300
Anti HAV	ELISA	Single serum	200
Hepatitis B surface	Antigen RPHA[7]	Single serum	50
(HBs Ag)	ELISA	Single serum	100
Anti HBs	PHA	Single serum	50
	ELISA Abbot	Single serum	200
HBe Ag	RPHA	Single serum	50
	ELISA	Single serum	200
Anti HBe	PHA	Single serum	50
	ELISA	Single serum	200
Anti HBc	PHA	Single serum	50
	ELISA	Single serum	200
Anti HBc IgM	ELISA	Single serum	200
Rabies	Mouse inoculation	Brain, Saliva	200

1. CF : Complement fixation test
2. PHA : Passive hemagglutination test
3. HAI : Haemagglutination inhibition test
4. SPIHAD : Solid phase immunosorbent hemadosorption test
5. IAHA : Immune adherence hemagglutination test
6. NT : Neutralization
7. RPHA : Raverse passive hemagglutination

* Paired sera: Clotted blood 5-8 ml is acceptable

III. Isolation

Chlamydia trachomatis	Cell culture	Conjunctival swam Urethral swab Cervical swab	100
Chikungunya	Cell culture	Blood	100
Coxsackie B	Cell culture	Throat swab, Feces	100
Dengue	Cell culture	Blood	100
Herpes simplex	Cell culture	Vesicular fluid, Lesion swab, Brain, CSF	100
Influenza	Egg inoculation	Throat swab	100
Japanese eucephalitis	Cell culture	Brain, CSF	100
Poliovirus	Cell culture	Feces, Throat swab	100

資料 6. 3

ACUTE DIARRHAEA

AGE	ATTACK RATE
1	109.9
2	50.7
3	29.2
4	20.2
5	6.7

ETIOLOGIES

EPEC + ETEC	=	39.30%
GIARDIA LAMBLIA	=	8.49%
CAMPYLOBACTER JEJUNI	=	8.02%
ROTAVIRUS (ELISA)	=	6.13%
SALMONELLA + SHIGELLA	=	5.66%
AEROMONAS HYDROPHILA	=	0.47%
ANTAMOEBA HISTOLYTICA	=	0.47%

(Prof. Dr. Prasert Thongcharoen,
Dept. Microbiology, Fac. Medicine,
Siriraj Hospital)

資料 6.4 狂 犬 病 情 報

RABIES VACCINE

1885 FIRST ADMINISTRATION OF PASTEUR RABIES VACCINE

1913 PRODUCTION OF PASTEUR VACCINE IN THAILAND

1930 SAMPLE VACCINE 1% BRAIN CONCENTRATION

1930 SAMPLE VACCINE 3% BRAIN CONCENTRATION

1946 SAMPLE VACCINE 5% BRAIN CONCENTRATION
(80,000 COURSE/YEAR)

1967 SUCKLING MOUSE BRAIN VACCINE (SMBV)
(2,500 COURSE/YEAR)

1978 HUMAN DIPLOID CELL VACCINE (HDCV)

? 1985 PURIFIED CHICK EMBRYO CELL VACCINE (PCEC-V)

BAT RABIES SURVEY IN THAILAND 1966 - 1969

YEAR	NUMBER OBSERVED	NUMBER POSITIVE	SPECIES	AREA
1966	202	10	NOT IDENTIFIED	BANGKOK, KAO-YAI, SARABURI, PHRA PRADAENG
1967	79	2	*CYNOPTERUS BRACHYOTIS*	KANCHANABURI
1968	34	1	*C. BRACHYOTIS*	NAKHON RATCHASIMA
	40	1	*C. SCOTOPHILUS*	NAKHON RATCHASIMA
1969	78	0	*TRADARIA PLICATA* *TAPHOZOUS THEOBALDI*	SARABURI
TOTAL	483	14 (3.23%)		

(Prof. Dr. Prasert Thongcharoen, Dep. of Microbiology, Fac. Medicine Siriarj Hospital)

資　料　7

調査員訪問先一覧

資料 7　調 査 員 訪 問 先 一 覧

Department of Medical Sciences

Dr. Nadhirat Sangkawibha	Director General
Mrs. Preeya Kashemsant	Deputy Director General
De. Panchitta Ekachampaka	Deputy Director General

Medical Research　　Miss Panida Kanchanapee　　Director

Medicinal Plant

Mrs. Wantana Ngamwat Senior Scientist, B.Sc, M.Sc.

Mr. Daroon Pecharaply B.Sc., M.Pharm. Sc.

Mrs. Passara Ngearndee B.Sc.

Miss Thaweephol Dechatiwongse B.Sc.

Mrs. Uraiwan Permpipat B.Sc.

Miss Niyada Kiatyingungsulee B.Sc. M.Pharm. Sc

Dr. Renu Koysooko Ph.D.

Miss Puntarika Charoonroje B.Sc.

Dr. Wutichai Nutakul Ph.D.

Dr. Pittaya Tuntiwachwuttikul Ph.D.

Biological Products Control

Mr. Smarn Pongpairoj

Mrs. Kanchana Lelasiri

Mrs. Teeranart Jivapaisarnpong

Mr. Teerapon Kachacheewa

Dr. Boonruam Chokuaychai

Med. Entomology

Dr. Boonluan Phanthumachinda	Director
Mr. Prakong Phanurai	
Mrs. Nipa Benjaphong	
Mr. Thumrong Phonchevin	

Virus Res. Inst

Dr. Kanai Chatiyanonda	Director
Mr. Wattana Auwanit	Senior Scientist
Dr. Chuinrudee Jayavasu	
Miss. Suntharee Rojanasuphot	
Mrs. Kruavon Balachandra	
Miss Wallapa Israńkul Na Ayuthya	
Dr. Nonglak Asavachinda	
Dr. Siri Sawasdikosol	
Dr. Pornthip Samuthananont	
Mrs. Chandana Kun-anake	
Mrs. Boonsong Pojanagaroon	
Dr. Sumalle Boonmar	
Mrs. Suranga Saguanwongse	

Toxicology

Mr. Alan Idsavas	Director
Miss Lagsana Leuprasert	
Mr. Somboon Suphacherabhan	
Mr. Krirk Ratarpa	

Scientific Instrument Center

Dr. Somkiat Wangkobkiat	Chief Scientist
Mr. Chusak Chumnanyantarakit	Scientist
Mr. Sasiwong Doungdate	

Food Analysis

Mrs. Chaweewan Halilamian	Director
Miss Amara Vongbuddhapitak	Senior Scientist
Mr. Prakai Boriboon	Scientist
Miss Orana Chaiwararatana	Scientist

Radiation Protection Services

Dr. Paiboon Sa-Ngobwarcha	Director

Health Lab. Quality Control

Mr. Kul Boranintra	Director
Miss Somboon Nakornsri	

Clinical Path.

Dr. M.L. Ratanasuda Phan-Urai	Director
Mrs. Surang Dejsirilert M.Sc.	
Mrs. Siripan Wongwanich M.Sc.	
Miss Orn-Anong Ratchtrachenchai B.Sc.	
Miss Krongkaew Supawat B.Sc.	
Miss Renu Sunthadvanich B.Sc.	
Dr. Vinita Boriraj M.D. Ph.D	
Miss Sugunya Giateium M.Sc.	
Mr. Preecha Panyaraggij Lab. Tech.	
Mrs. Panthip Sinthuwongsanondh B.Sc.	

Drug Analysis

Miss Boonlarp Kitisin	Director
Mrs. Santhong Sawasdiphab	Senior Scientist
Dr. Chongdee Wongpinairat	
Mrs. Rachanee Pintavorn	
Miss Wirarat Kammuang	
Mrs. Arpapun Tongbomrawd	

Office of Secretary

Miss Amnueyphorn Tantivejakul	Director
Miss Kitima Serikul	(Foreign relations)

Animal Center

Dr. Kanai Chatiyanonda	(virus)
Mrs. Wantana Ngamwat	(Medicinal Plant)
Mrs. Teeranart Jivapaisarnpong	(Biological Product)
Dr. Ratanasuda Phan-Urai	(Clinical Pathology)
Mrs. Rachanee Pintavorn	(Pharmaceutical Sci.)
Mrs. Lagsana Leuprasert	(Environmental)
Miss Panadda Sae-Eung	(Food Analysis)

RI Committee

Paiboon Sa-Ngobwarcha (Chairman)	Radiation Protections Services
Somkiat Wangkobkiat	Scientific Instrument Center
Panadda Sae-Eung	Biomedical Research in Food
Renu Koysooko	Medicinal Plant Research
Chongdee Wongpinairat	Pharmaceutical Sciences
Charnchudhi Chanyasanha	Virus Research Institute
Sugunya Gate-ium	Clinical Pathology
Kongsak Tangpoonpholvivat	Radiation Protection Services
Krirk Ratarpa	Toxicology

Regional Medical Science Center

Chiang-Mai

Miss Napaporn Pancha	Director
Mrs. Sutheewan Sriupayo	Food analyst
Mr. Sompong Kittiponghunsa	Drug Analyst
Mrs. Preeyanat Tanvisuth	Scientist

Nakhorn Ratchasima

Miss Prachuarb Isarangkul	Director

Songkhla

Mr. Kietisak Rugkietsakul	Director

Chonburi

Mr. Charlermsak Tongthammachart	Director
Mr. Kruanaronk Temrak	Bacteriologist

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Dr. Banphot Buranasin	Director

General Hospital of Songkhla

Dr. Paiboon Weshasarn	
Dr. Nayada Meenakanit	Pediatrician
Dr. Virat Anantvoranich	Community medicine

Haad-Yai Hospital

Dr. Chamlong Borkird	Director

Chonburi Hospital

Dr. Panya Sonkom	Director

Ministry of Public Health

Dr. Amorn Nondasuta	Permanent Secretary

Division of Epidemiology

Dr. Prayura Kunasal	Director

The Government Pharmaceutical Organization

Dr. Yongyoot Sujjavanich	Director

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Mr. Athorn Patumasootra	Secretary-General
Mr. Anan Yuthamanop	Director of Health Physics

Chulalongkorn Univ. Inst. of Health Research

Prof. Nikorn Dusitsin	Director

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Dr. Natth Bhamarapravati	

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Prof. Savanat Tharavanij	Dept. of Microl & Imm.

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Prof. Pornchai Matangkasombut	Dept. of Microbial.
Prof. Stitaya Sirisinha	"

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Dr. Udomporn Chularesk	Dept. of Parasitol.

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Dr. Pradon Chatikavanji	Director

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Dr. Chantapong Wasi	Virology	- Dept. of Microbiol.
Dr. Saowarose Imwidhya	Bacteriology	
Dr. Pilaipan Puthavathana	Virology	
Prof. Vikit Viranuvatti	Dean	

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Prof. Pien Chiowanich	Dept. of Pediatrics
Prof. Boonyong Pongprot	Associated Dean
Mrs. Somboon Suprasert	Dept. of Community Medicine
Dr. Choomnoom Promkuteaw	"

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Dr. Sanit Makornkaewkayoon	Clinical Immunology
Mrs. Kanchwan Ukoskit	Radiology
Dr. Panya Kulapong	Pediatrics

Prince of Songkhla University and Hospital

Dr. Udom	Director