

SEATO MEDICAL RESEARCH STUDY ON LABORATORY ANIMALS

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## STUDY REPORTS

1. Title: "Nutritional and Health Requirements for Development and Maintenance of Conventional Animal Colonies".

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Objective: The objective of this study is to produce, procure, and maintain healthy laboratory animals to support investigative programs and to determine procedures and standards for production and maintenance of conventional laboratory animals under conditions existing in this area.

Description: Surveys have been instituted in all rodent production colonies to determine the incidence and extent of parasitic infestations, latent virus infections, bacterial infections and presence of pathological conditions which may affect the outcome of investigations utilizing these animals as biological models. Measures are taken to correct these conditions when feasible. Vigorous standards are maintained in all rodent colonies for selection of breeder stock in order to increase litter size, growth rates, weaning rates and to insure as much uniformity of animals as possible.

All animals purchased for investigative work are examined at the time of purchase and all subhuman primates are quarantined prior to issue to investigators. Individual clinical records are maintained on all subhuman primates and necropsies are performed on all animals that die within colony.

Progress: A survey of the mouse colony revealed that 74.6% of the adult mice examined were infested with oxyurids (Syphacia obvelata and Aspicularis tetraptera) and that 27.3% of the mice examined were harboring Hymenolepis citelli. A limited anthelmintic trial on adults from the colony indicated that piperazine citrate administered at a dosage of 400 mg per 100 cc of drinking water given to the animals for 7 days, followed by 7 days with untreated water and another 7 days with treated water greatly reduced or

eliminated the oxyurid infestation with no apparent ill effects to the mice. Such medication is easily accomplished and does not require extra handling of the mice. Treatment has now been started in the production colony and results to date are excellent. Feedbins located in the mouse building and containing locally procured feed for other animals were found to be contaminated with meal beetles. Such feedbins have been moved from the premises of the mouse building areas. With the elimination of these intermediate hosts and with the normal replacement of infested breeder stock, tapeworm infestations are greatly reduced.

No infestations of the tropical rat mite (Ornithonyssus bacoli) have been found during the period of this report.

Sera from 95 randomly selected adult mice were submitted for antibody determination against the following latent mouse viruses: Pneumonia Virus of Mice (PVM), Polyoma, K Virus, Mouse Adenovirus, Mouse Hepatitis Virus, Reovirus 3, Sendai, and GD VII. Results of these antibody determinations are summarized in Table I.

Table I  
MURINE VIRUS ANTIBODY DETERMINATION

Virus	Serum Dilution				Total Positive	% Positive
	1:10	1:20	1:40	1:80		
Pneumonia Virus Mice	NT	0	0	0	0	0.00
Polyoma	NT	0	0	0	0	0.00
K Virus	0	0	0	0	0	0.00
Mouse Adenovirus	2	1	0	0	3	3.16
Mouse Hepatitis Virus	2	1	0	0	3	3.16
Reovirus 3	NT	14	3	3	20	21.53
Sendai	11	28	11	5	55	52.63
GD VII	NT	18	20	20	58	61.05

NT = not tested

Total Number Sera Tested -- 95

Of 150 adult mice necropsied, 118 (78.6%) had no gross pathological lesions. Gross lesions most frequently found were consolidated lungs (12%) and discolored or mottled livers (11.3%). Microscopic examination of lung tissue showed pneumonitis and broncho-pneumonia. Most microscopic liver examinations were unremarkable. Specimens submitted for bacteriological examination revealed no bacteria considered to be pathogenic.

During September and October there was a reoccurrence of a disease which had been previously reported in the rat colony. The disease produced a high mortality (45%) in suckling rats and was clinically characterized by stunting, listlessness, dehydration cyanosis and death. The disease had previously been presumed to be of viral etiology, however cell free filterates of intestinal contents and 20% brain suspensions failed to infect mice by either intraperitoneal or intracranial inoculation. Ingesta, feces, and intestinal contents force fed to suckling mice also failed to produce disease in mice. Attempts to isolate a viral agent in monolayer cultures of primary hamster (HK) cells and in continuous line monkey kidney (MK) cells were unsuccessful. Bacteriological cultures were negative for pathogens. The only gross pathological lesion consistently found at necropsy on baby rats which had died was a gaseous distention of intestinal tract. No blockage of the intestinal tract was evident although minute particles of sawdust could be found in the lumen. 10 moribund baby rats were sacrificed and necropsied with the aid of a dissecting microscope. Blockage of the ilio-cecal orifice by particles of bile stained material was present in all animals. Microscopic examination showed the obstructions to be of ligneous nature. Locally purchased sawdust bedding (10% of which passed a 100 mesh screen) was suspected of being the cause of the deaths. Subsequently only sawdust bedding retained by a 20 mesh screen has been used and known suckling mortality has been reduced to less than 2% as compared with 45% when unscreened sawdust was used.

Animal production figures for the rodent colonies are shown in Table II.

Table II  
ANIMALS BORN IN RODENT COLONIES

Animals	Number of Litters	Number of Animals	Average/Litter
MICE	28,864	265,121	9.18
RATS	1,232	10,520	8.53
HAMSTERS	1,764	12,115	6.86
GUINEA PIGS	455	1,506	3.31
Total	32,315	289,262	

Animals issued to investigators during the report period are shown in Table III.

Table III  
ANIMALS ISSUED

	PRODUCED			PURCHASED		
	Suckling	Juvenile	Adult	Suckling	Juvenile	Adult
MICE	69,435	37,562	7,247	—	—	—
RATS	148	4,094	286	—	—	—
HAMSTERS	—	2,625	276	—	—	—
GUINEA PIGS	—	676	208	—	700	—
RABBITS	—	—	—	1,799	—	682
GIBBONS	—	—	—	—	48	28
MONKEYS	1	—	—	—	—	72
CHICKENS	—	—	—	—	—	3

Total Animals Issued 125,213  
Embryonated Eggs Issued 967 dozen.  
Animal Blood Issued 36,000 cc.

During November one juvenile gibbon at Prabuddhabat died of cysticercosis. The cysticerci were identified as larval stages of Taenia solium. Efforts to trace the source of infection were unsuccessful. In an effort to determine if the gibbon could possibly harbor adult Taenia solium and if cysticercosis could result from autoinfection, 15 viable cysticerci obtained from pork at a local abattoir were fed to another juvenile gibbon. On the 53rd day after feeding the cysticerci, Taenia eggs were recovered from the gibbon's stool and on day 55 proglottids were noted in the feces. On day 110 the gibbon appeared depressed and lethargic. By day 112 the gibbon had become comatose and euthanasia was performed. Necropsy revealed hundreds of 2-3 mm. cysts involving muscle tissue, brain, liver, lungs and spleen. One adult tapeworm approximately 60 cm. in length was removed from the small intestine.

The fungus previously isolated from gibbon skin lesions has been identified as an atypical strain of Microsporium canis. The organism is sensitive to griseofulvin. Infections continue to occur in the gibbon colonies principally at Phrabuddhabat, however response to treatment has been slow.

Summary: Animals produced (mice, rats, guinea pigs and hamsters) are available in sufficient numbers to meet planned or anticipated research requirements.

Mouse colony surveys show that GD VII, Sendai, and Reovirus 3 infections are common in the colony and that infestations with oxyurids and tapeworms occur. Corrective measures are being taken to improve the quality of mice issued to investigators.

A disease producing high mortality in suckling rats has been shown to be caused by ingestion of fine particulate sawdust in bedding material.

The gibbon (Hylobates lar) was shown to be a susceptible host of both adults and cysticerci of Taenia solium.