

## Tick-borne Viruses in Thailand

### 2. Experimental Infection of Gibbons with a Group B Arbovirus (T-1674)

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**OBJECTIVES:** 1) To determine if a group B tick-borne arbovirus (T-1674) was infectious for gibbons and, if so, 2) to identify any evidence of illness that might also occur in man.

**BACKGROUND:** Tick-borne group B arbovirus infections of man may be asymptomatic or cause mild to severe encephalitis. A new strain of group B arbovirus, T-1674, which was isolated from *Haemaphysalis papuana* ticks in Khao Yai National Park (1) was tentatively identified as Langkat virus. Langkat virus, a member of this group, has been shown to be infectious for rhesus, cynomolgus and spider monkeys but not to cause disease. Experimental infection of gibbons has not been reported. Since gibbons are present in abundance in the area in which T-1674 was found, it is possible that gibbons may be a natural host for this virus.

**DESCRIPTION:** Three adult gibbons, *Hylobates lar*, which had been cared for by the Dept of Veterinary Medicine, SEATO Medical Research Laboratory for 8 to 9 years, were selected for experimental infection after determining they had no detectable antibody by hemagglutination inhibition (HI) tests to Langkat and 5 other group B arboviruses. Two animals (P5, B66s) were inoculated intracutaneously with 1.0 ml each of a low passage suckling mouse brain (SMB) suspension containing T-1674 at a titer of  $10^{4.1}$  suckling mouse LD<sub>50</sub>/ml. One of these gibbons (B66s) had a splenectomy 7 years previously. The third animal (B56) was inoculated with a placebo and housed in a cage between the infected gibbons. Each animal was observed daily for evidence of illness. Blood samples were collected daily for the first 10 days, then approximately weekly for the first month. Viremia was detected by inoculation of plasma into suckling mice.

**PROGRESS:** No differences were observed between the three animals with regard to food and water intake, rectal temperature and general behavior that were not within the range of expected daily variation. None of the animals developed a detectable rash, neurological abnormalities, lymph node enlargement or splenomegaly.

Both gibbons who received T-1674 had viremia from days one to six after inoculation; plasma virus titers reached  $10^3$  suckling mouse LD<sub>50</sub>/ml on day two and three, respectively. Both animals subsequently developed antibody detected by complement fixation (CF), HI and plaque reduction neutralization test (PRNT) after day 10 (Figure 1). The control gibbon did not develop viremia or detectable antibody. Routine hematological studies showed a temporary fall in hematocrit for each animal during the 10 day period of daily blood collection (Figure 2) which was attributed to frequent phlebotomy. B66s had a long previous record of leukocyte counts above 8000 wbc/ml following splenectomy. The two infected gibbons developed increased total lymphocyte levels relative to their baseline values from days 3 to 10 and 4 to 17, respectively. In these animals, mononuclear cells accounted for 58-70% and 82-88%, respectively, of all leukocytes from days four to nine after infection. In contrast, the control gibbon had 4000 lymphocytes/ml or less during the same time period and 44-63% mononuclear cells.

**SUMMARY:** Two adult gibbons were experimentally infected with T-1674, a group B arbovirus tentatively identified as Langkat virus. Both animals developed viremia from days one to six after infection followed by antibody detected by CF, HI and PRNT. Peak antibody levels were obtained one month after infection. Both animals developed relative and absolute lymphocytosis during the first three weeks after infection but neither developed overt disease. A temporary fall in hematocrit was also seen in the infected and the control animals and was attributed to frequent phlebotomy. It was concluded that T-1674 can cause asymptomatic infections with viremia in gibbons. No additional information was learned about the potential pathogenicity of T-1674 for man.

**REFERENCES:**

1. Bancroft, W.H., Gould, D.J., Snitbhan, R., et al.  
SEATO Medical Research Laboratory Annual Report, March 1974.

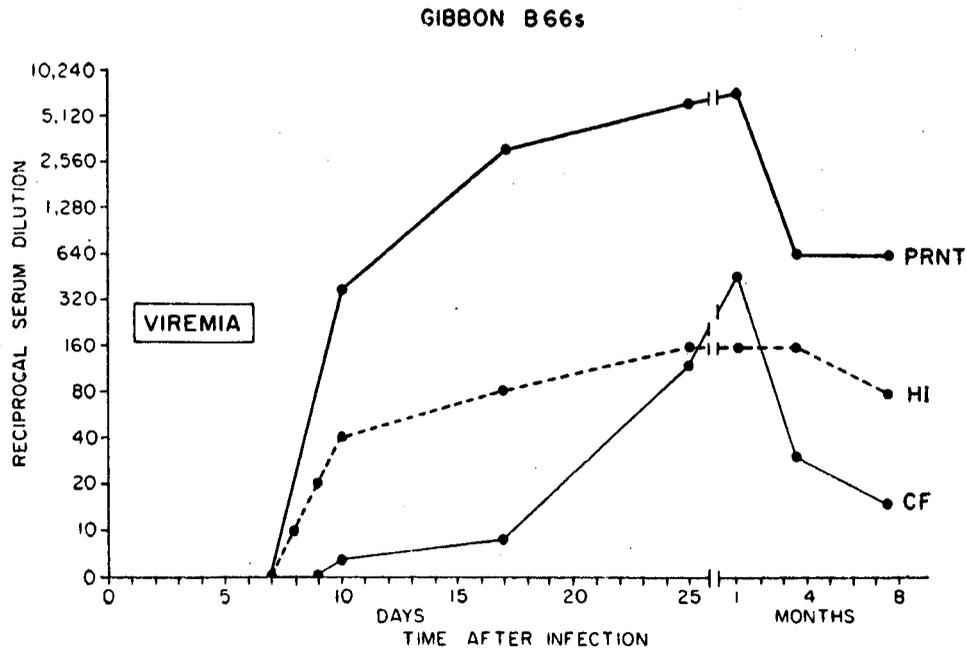
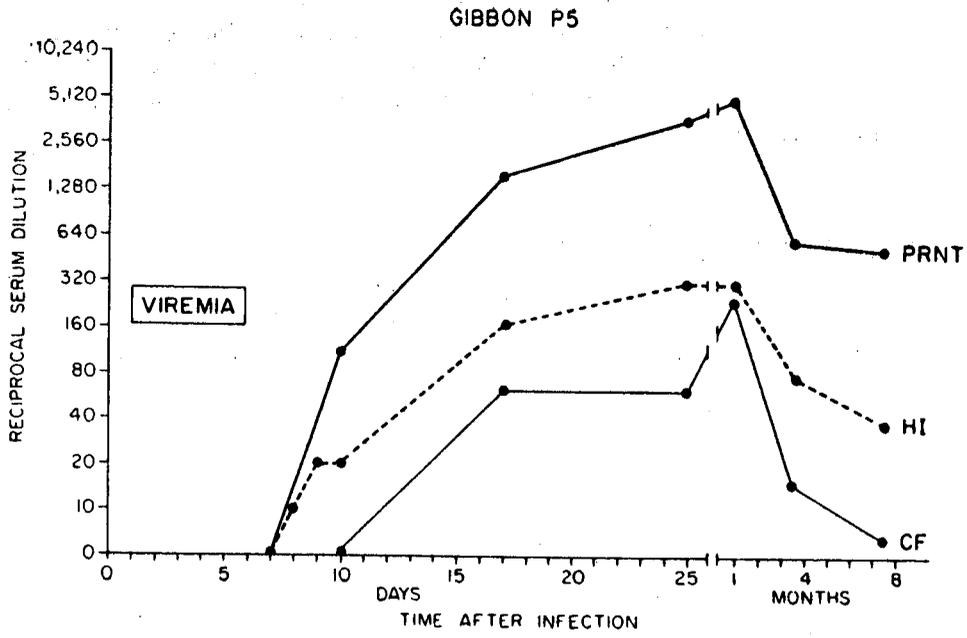


Figure 1. Response of two gibbons to intracutaneous inoculation of  $10^{4.1}$  suckling mouse  $LD_{50}$  of T-1674 on day 0

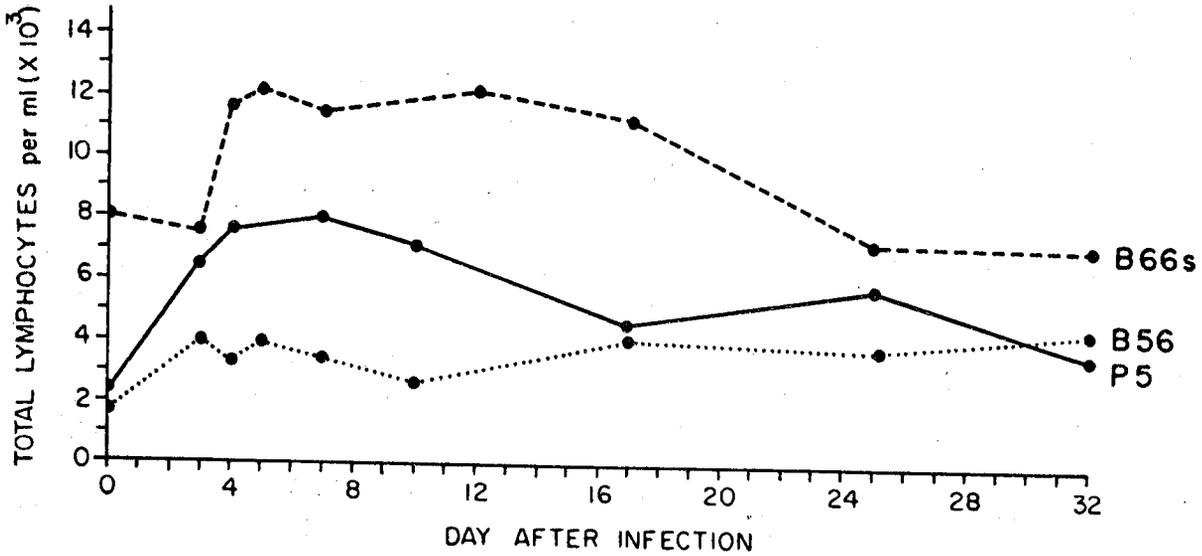
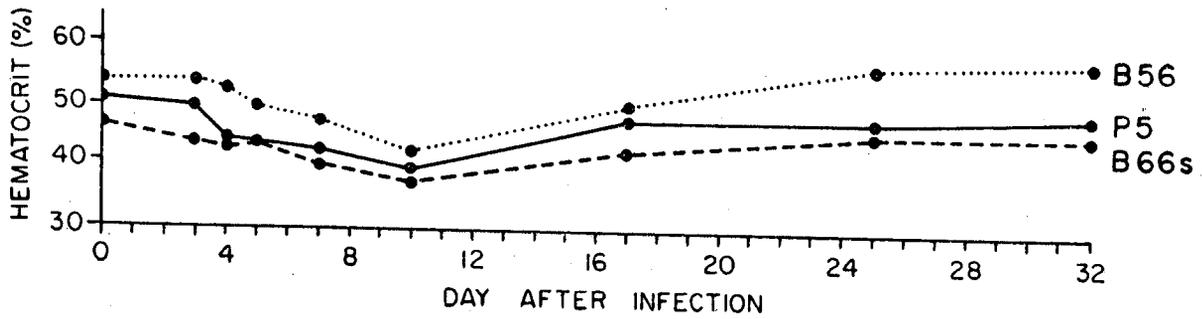


Figure 2 Serial hematocrit and total lymphocyte counts for two gibbons infected with Langkat Virus (P5, B66s) and one control (B56). Infection began on day 0.