THE EPIDEMIOLOGICAL STUDY OF CHIKUNGUNYA IN YUNNAN PROVINCE, CHINA

by

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In 1986-1988, two strains of chikungunya (CHIK) virus were isolated from the brain tissues of bats (Roussettus leschenaulti), three strains from Aedes albopictus and Culex tritaeniorhyncus, and a strain from serum sample of unknown fever case collected from Xishuangbanna area, Yunnan Province, China. These six virus strains could cause illness death in suckling mice and produced evident CPE in C6/36, BHK21, Vero and primary hamster kidney cells. These virus strains contain RNA, are sensitive to acid and ether but resistant to 5-FUDR. The strains were also found capable of agglutination red blood cells of dove, goose, chick, duckling and sheep at pH 5.75-6.4. By electronmicroscopic examination of ultra-thin sections of brain tissue of infected suckling mice, spherical enveloped virus particles were found, approximately 66.8 nm in external diameter and 47.7 nm in internal diameter. These viruses have been identified serologically by hemagglutination inhibition (HI), immunofluorescent and neutralization tests. Each showed specific reactivity with high titres to CHIK virus only. Therefore these six virus strains have been proved as CHIK virus. This is the first report of isolation of CHIK virus in China.

Sera from healthy human population and animals in Yunnan were tested for antibodies against CHIK virus by HI test with positive results of 10.07 per cent (275/2731) for human beings, 49.30 per cent (140/284) for Roussettus leschenaulti, 55.56 per cent (45/81) for Opopopelia tranquebarica birds, 18.18 per cent (2/11) for Suncus murinus, 4.06 per cent (8/197) for pigs, 2.59 per cent (9/347) for Rattus flavipectus, 2.45 per cent (5/204) for Macaca mulatta and 1.80 per cent (2/111) for dogs. These results demonstrate that CHIK virus infection occurs in humans and animals in Yunnan province.

Evidence from these investigations show that the west and south parts of Yunnan province are natural foci of CHIK virus, that bats, birds, pigs, and monkeys might be important hosts, and that Aedes albopictus and Culex tritaeniorhyncus might be the vectors of CHIK virus.