

## RABIES IN INDIAN FRUIT BATS (*CYNOPTERUS SPHINX*) IN THE UAE

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Lyssaviruses are a group of viruses that include rabies and bat lyssavirus. Bat Lyssavirus is a virus that is related to, but slightly different from rabies. While rabies occurs in many parts of the world, some countries, such as Australia, the UK or the UAE are free of rabies. However, even in these countries, bat Lyssavirus may infect humans as reported from UK (Nathwani et al., 2003). In the light of this situation, we would like to raise awareness of a possible danger, imported wildlife may pose to humans in the Middle East.

In August 2011, CVRL received 3 frozen carcasses of Indian Fruit Bats (*Cynopterus sphinx*) for necropsy (Fig. 1). These animals arrived 2 months earlier in the UAE with no history of origin, or sickness. At necropsy they were in good condition (330 to 360 g). Even though rabies testing was not requested on submission, rabies-IFT was performed on brain samples with positive results in all cases (Fig 2a). Histology revealed encephalitis with perivascular mononuclear infiltrates. However, no inclusions were seen (most probably due to freezing artifacts).

Transmission of rabies by bats was first reported in 1921 (Haupt and Rehaad, 1921) and vampire bats (*Desmodus rotundus murinus*) have been known to shed the virus in their saliva for long periods of time without apparent illness (Torres and Lima, 1935). Goodwin and Greenhall (1961) found at least 8 species of bats in Trinidad had been infected with the rabies virus, including two species of Fruit-eating bats, the short tailed fruit bat (*Carollia perspicillata*) and the Jamaican Fruit bat (*Artibeus jamaicensis*). Non bite transmission was demonstrated in Texas (Constantine, 1962), possibly due to virus excretion through the urine of bats.

Over the last 20 years several fatal cases of human infection with Bat Lyssavirus have been recorded, with two in Queensland, Australia in the mid-1990s. In Australia, both the larger flying foxes (or fruit bats) and the smaller insectivorous (or micro) bats have been found to carry Australian Bat Lyssavirus.

In Europe a single Daubenton's bat (*Myotis daubentonii*) was found to be infected in New Haven, UK with a rabies like virus: European bat Lyssavirus 2 (Whitby et al., 2000). In September 2002 another bat was found to be positive for same virus in Lancashire, UK (Johnson et al., 2002). In November 2002 a Scottish bat conservationist from Guthrie, Angus, was bitten by a bat and subsequently died. He was the first human to contract rabies in the United Kingdom since 1902 (Nathwani et al., 2003).

Until 50 years ago there were no reports of rabies in bats in South-East Asia, and publications of the World Health Organization state that surveys of bat rabies in Asia have been consistently negative (Duttka, 1997). However, Rabies Virus was isolated from Fruit Bats in Thailand for the first time in 1967, (Smith et al., 1967). In a recent study (Lumlertdacha et al., 2005) a total of 932 bats of 11



Fig. 1: Frozen carcasses of Indian Fruit Bats (*Cynopterus sphinx*) for necropsy

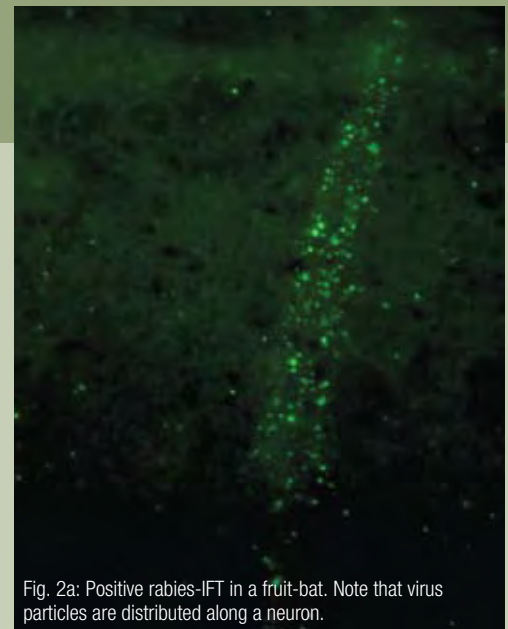


Fig. 2a: Positive rabies-IFT in a fruit-bat. Note that virus particles are distributed along a neuron.

species were captured in Thailand and released after serum collection. No serum samples had evidence of neutralizing antibodies when tested against rabies virus. However, 16 samples had detectable neutralizing antibodies against Aravan virus, Khujand virus, Irkut virus, or Australian bat lyssavirus; all were specifically associated with fruit bats *P. lylei* (n = 15) and *E. spelaea* (n = 1).

As with our cases, infected bats may not show any clinical symptoms. Hence, care must be taken, when new bats arrive in any collection. As shown recently (Lumlertdacha et al., 2005), no neutralizing antibodies against rabies virus were found in bats from Thailand. However, some samples from these fruit bats had detectable neutralizing antibodies against Australian bat lyssavirus; indicating no cross reactivity between these viruses.

The IFT is the diagnostic method of choice in dead animals, but there are no diagnostic tools to identify the virus in live animals. At CVRL a FITC-labelled goat-anti-rabies-virus antibody was used (SIFIN, Berlin, Germany). As with most domestic animal samples, when IFT is performed on bat samples, the slides must be thoroughly scanned (Fig. 2b). as virus particles are not evenly distributed in the brain tissue (Fig. 2a).

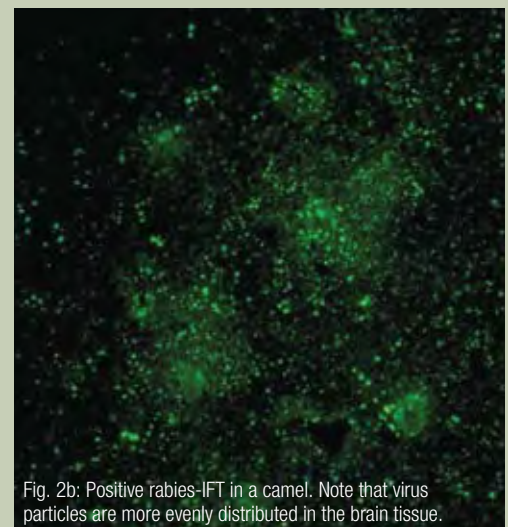


Fig. 2b: Positive rabies-IFT in a camel. Note that virus particles are more evenly distributed in the brain tissue.

Full references are available in the online version.