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SHORT COMMUNICATIONS

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Prevalence of Ife Virus Infection in Wild Rodents and Birds from Zaria, Nigeria

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ABSTRACT: One hundred eighty-three wild rodents and 38 wild birds trapped near Zaria were screened for virus and complement fixing (CF) antibody to Ife virus. Virus was not isolated but CF antibody was detected in 8% *Cricetomys gambianus* and 31% *Arvicanthis niloticus* tested. The presence of Ife virus has been documented now in three ecological zones of Nigeria.

Key words: Ife virus, rodents, birds, Nigeria, *Cricetomys gambianus*, *Arvicanthis niloticus*, complement fixing antibody, survey.

Ife virus, an antigenically ungrouped orbivirus was isolated first from the salivary gland, blood and brain of bats (*Eidolon helvum*) at Ife, Nigeria and subsequently at Abuja in Nigeria and Saa in Cameroon in 1971 (G. E. Kemp, cited in Karabatsos, 1985). The virus was considered as a possible arbovirus, but there is little information on its epidemiology or veterinary and public health significance (Karabatsos, 1985). It is suggested that other domestic and wild animal species might be involved as natural hosts of the virus. Thus, the present study was initiated to determine the prevalence of Ife virus infection in wild rodents and birds from Zaria, Nigeria.

Between December 1985 and March 1986, 183 wild rodents including four Kemp's gerbils (*Tatera kempi*), one West African ground squirrel (*Xerus erythropus*), 53 giant rats (*Cricetomys gambianus*), five climbing wood mice (*Rattus alleni*), 12 roof rats (*Rattus rattus*), 102 rufous Nile rats (*Arvicanthis niloticus*) and six three-stripped mice (*Hybomys trivirgatus*) were live-trapped with locally designed traps in villages near Zaria. Thirty-eight wild birds including eight bush sparrows (*Petronia dentata*), four grey-backed camaropteras (*Camaroptera brachyura*), two red-tailed chats (*Cercomela familiaris*), four black-billed wood doves (*Turtus abyssinicus*), four yellow white-eyes (*Zosterops senegalensis*), six scally-fronted weavers (*Sporopipes frontalis*), four Senegal puff-back flycatchers (*Batis senegalensis*), and six village weavers (*Ploceus cucullatus*) were live-trapped with mist nets on the Ahmadu Bello University Farm. Rodents and birds were identified according to Both (1966) and Serle et al. (1977), respectively. Blood samples were taken from rodents and birds by cardiac puncture (large species) or by decapitation (small species). Sera derived from the host blood were stored at −70 C until testing. Tissue samples of brain, liver, spleen (rodents only) and kidney were obtained at necropsy and stored also at −70 C for subsequent viral isolation. Ife virus (strain IBAN57928) obtained from Professor O. Tomori (Department of Virology, College of Medicine, University of Ibadan, Ibadan, Nigeria) was passaged intracerebrally in 2-day-old suckling Swiss albino mice. Antigen was prepared from harvested infected mouse brain by the sucrose acetone extraction method of Clarke and Casals (1958). Immune mouse ascitic fluid was prepared as described by Tikasingh et al. (1966). All sera were inactivated at 56 C for 30 min and the rodent

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TABLE 1. Prevalence of antibodies to Ife virus in rodents from near Zaria, Nigeria.

Species	Number positive/number tested	Percent positive	Complement fixing antibody titres						
			1:20	1:40	1:80	1:160	1:320	1:640	1:1,280
Kemp's gerbil (*Tateri kempi*)	0/4	0							
West African ground squirrel (*Xerus erythropus*)	0/1	0							
Giant rat (*Cricetomys gambianus*)	4/53	8					2	2	
Climbing wood mouse (*Rattus alleni*)	0/5	0							
House rat (*Rattus rattus*)	0/12	0							
Rufous Nile rat (*Arvicanthis niloticus*)	32/102	31	2	2	6	5	4	8	5
Three-striped mouse (*Hybomys trivirgatus*)	0/6	0							
Total	36/183	20	2	2	6	5	6	10	5

sera were tested for the presence of Ife virus antibody by a complement-fixation test (Sever, 1966). Avian sera were tested also by the complement-fixation inhibition test (Tesh and McCammon, 1979). Sera were tested at an initial dilution of 1:5 and positive samples were then titrated. The tissue samples were ground in chilled mortars and prepared as 20% suspensions in phosphate buffered saline (pH 7.2) containing 0.75% bovine serum albumin, 100 I.U./ml penicillin and 100 μg/ml streptomycin. The tissue suspensions were centrifuged at 503 *g* for 5 min and 0.02 ml

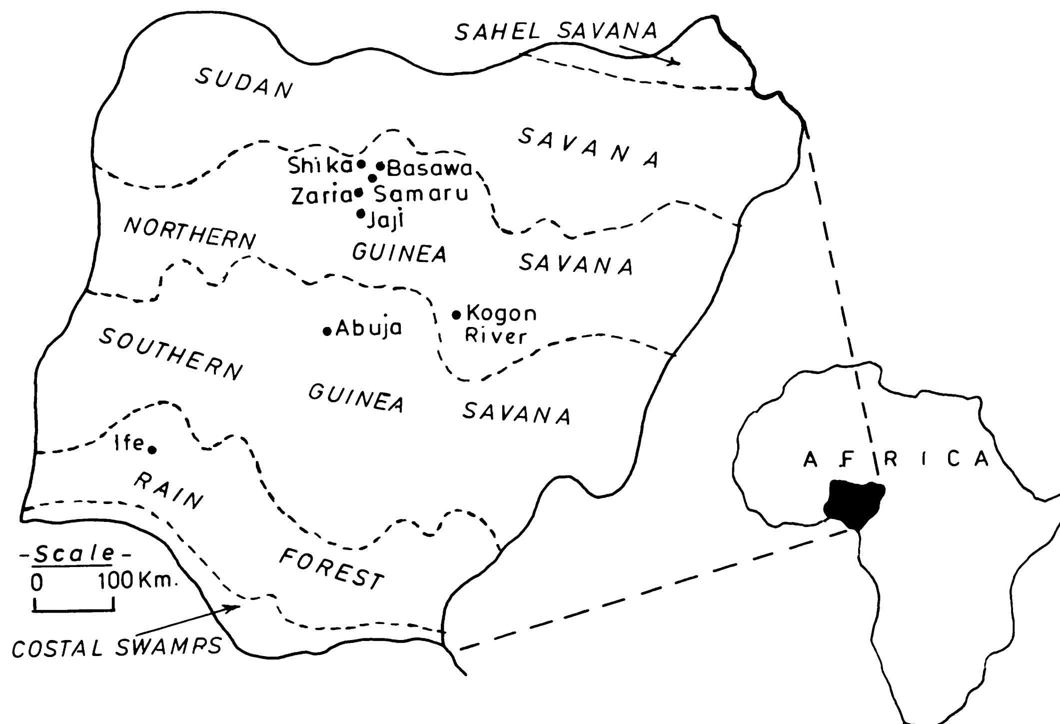

FIGURE 1. Vegetational map of Nigeria (after Kowal and Knabe, 1972).

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of the supernatant fluid was inoculated intracerebrally into 2-day-old suckling mice. Inoculated mice were observed for a 14-day period for signs of illness.

Four of 53 (8%) *Cricetomys gambianus* and 32 of 102 (31%) *Arvicanthis niloticus* had complement fixing antibody against Ife virus (Table 1). The other species of rodents and all the avian species tested were negative. From the limited data, there appeared to be geographical differences in antibody prevalences in the above two species of rodents. Of the total rodents collected, one of 18 (6%) at Kogom River, 13 of 76 (17%) at Samaru, 18 of 67 (27%) at Basawa, and four of 17 (24%) at Shika were positive (Fig. 1). The antibody titres ranged from 1:20 to 1:1,280. Antibody was not detected in five rodent samples collected at Jaji. Virus was not isolated from any of the rodent or avian tissue samples.

This study provides serological evidence of Ife virus infection in two rodent species, *Cricetomys gambianus* and *Arvicanthis niloticus*. Previously, Ife virus was associated only with bats (*Eidolon helvum*). A third ecological zone in Nigeria, the Northern Guinea Savana zone (Zaria) has now been added to the two previously described areas of Ife virus infection (Fig. 1); the Rain Forest zone (Ife) and the Southern Guinea Savana zone (Abuja) (Kowal and Knabe, 1972). Since CF antibody is of short duration, the CF test used in this study probably underestimates the overall extent of Ife virus prevalence. Also, it is possible that at lower titers, the test is detecting antibody to other closely related viruses unknown at this time. The mechanism of transmission and the veterinary and public health significance of this virus is still under study.

We wish to thank Professor O. Tomori for providing the virus used in this study.

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