

An epidemic of Rift Valley fever in Egypt

2. Isolation of the virus from animals

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During the epidemic of Rift Valley fever (RVF) that occurred in Egypt and other areas of North Africa in 1977, the virus was isolated from various species of domestic animal and rats (Rattus rattus frugivorus) as well as man. The highest number of RVF virus isolates were obtained from sheep; only one isolate was recovered from each of the other species tested, viz. cow, camel, goat, horse, and rat. RVF virus was reisolated from both camel and horse sera, apparently for the first time.

In previous communications (1, 2) we reported on the epidemic of Rift Valley fever (RVF) that occurred in Egypt and other areas of North Africa in 1977. The outbreak first appeared in man as an acute, febrile, dengue-like illness in Sharqiya Governorate in Egypt. In the preceding paper we have reported the isolation of RVF virus from 53 hospital patients.

The collection of specimens from animals, which started on 29 October 1977, was later expanded to include as many species of mammal as possible when the diagnosis of RVF was received on 3 November.

In this paper we report the isolation of RVF virus from sheep, cows, camels, goats, horses, and rats.

MATERIALS AND METHODS

Specimens for virus isolation were obtained mainly from farms in different governorates where deaths and/or abortions occurred. Certain specimens were collected by the Veterinary Department and sent to the Virus Research Centre (VRC) at Agouza, Cairo.

The 22 sheep specimens were obtained on 17 December 1977 from four farms at Damshir, Minia Governorate in Upper Egypt, where many abortions and deaths were reported. Blood samples were collected from all the sick feverish sheep (body temperature 39.4–41.3°C), and liver specimens were also obtained from the two sheep that died during the presence of the veterinarian.

On arrival at the VRC, the specimens were

treated and inoculated intracerebrally into suckling mice. The brains of sick mice were subsequently harvested and passed again intracerebrally in mice, and finally a sucrose-acetone-extracted antigen was prepared for virus identification (3). Characterization of the viral isolates was performed by the complement fixation (CF) test (4, 5), using a locally prepared specific immune serum (see the preceding paper.

RESULTS

Table 1 shows that the highest number of RVF virus isolates were obtained from sheep: of the 58

Table 1. Isolation of Rift Valley fever (RVF) virus from animals during the RVF epidemic in Egypt

Species	Locality	No. tested	No. positive	Remarks
Sheep	Marg, Qalyubia	14	3	isolation from serum
	Zagazig, Sharqiya	2	1	—
	Imbaba, Giza	5	0	—
	Damshir, Minia	22	17	isolation from serum of 17 and liver of 2 sheep
	Sohag	5	1	isolation from serum
	Manchiet Bakary, Pyramid, Giza	10	5	isolation from serum
Cow	Giza	16	0	—
	Manchiet Bakary, Pyramid, Giza	1	1	isolation from serum
Camel	Draaw, Aswan	30	1	isolation from serum
Goat	Imbaba, Giza	1	0	—
	Ghazala Geish, Sharqiya	3	0	—
	Manchiet Bakary, Pyramid, Giza	5	1	isolation from serum
Horse	Cairo	18	1	isolation from serum
Rat	Zagazig, Sharqiya	3	0	—
	Zagazig, Sharqiya	3	1	isolation from brain
	Belbeis, Sharqiya	2	0	—

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blood specimens tested, virus was recovered from 27 (47%). The virus was also isolated from the livers of the dead sheep mentioned above.

Apart from the isolates obtained from sheep, only one viral isolate was recovered from each animal species, viz, cow, camel, goat, horse, and rat (*Rattus rattus frugivorus*). RVF virus was reisolated from the camel and horse sera.

DISCUSSION

The isolation of RVF virus from sheep, cow, and goat is consistent with the known susceptibility of these animals to the virus (6-11).

The isolation of RVF virus for the first time from the camel in this study gives support to the finding of Scott et al. (12) of antibodies against RVF virus in sera collected from camels in Kenya.

Daubney et al. (6) reported that they were unable to infect a horse and two pigs with RVF virus. In a later study, Scott (13) demonstrated that the resistance of pigs to infection was not absolute, but was

related to the dose of virus inoculated. Out of 83 samples of horse serum tested in the present study, 15 exhibited HI antibodies against RVF virus at a titre of 1:20 or 1:40; these and other seroepidemiological data on the epidemic will be published separately.

RVF virus was also isolated from rat (*R.r. frugivorus*) at Zagazig, Sharqiya Governorate, where the RVF epidemic first appeared in man. Weinbren & Mason (14) found that the field rat (*Arvicanthis abyssinicus*) in Uganda carried a non-fatal infection and speculated that it could be a virus reservoir. On the other hand, Scott & Heisch (15) could not demonstrate antibodies or virus in the sera of 285 rodents (including *A. abyssinicus*) trapped in the Rift Valley of Kenya.

The role of these domestic animals and rodents — besides man — in the epidemiology of the disease in Egypt needs further investigation. Surveys for RVF virus and antibodies in sera of animals from different Egyptian localities, and also experimental infection studies using the local (Zagazig) isolate are of the utmost importance.

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RÉSUMÉ

ÉPIDÉMIE DE FIÈVRE DE LA VALLÉE DU RIFT EN ÉGYPTÉ 2. ISOLEMENT DU VIRUS CHEZ DES ANIMAUX

Au cours de l'épidémie de fièvre de la Vallée du Rift (FVR) qui s'est produite en 1977 en Egypte et dans d'autres régions d'Afrique du Nord, le virus FVR a été isolé chez diverses espèces d'animaux domestiques et le rat (*Rattus rattus frugivorus*) tout comme chez l'homme. C'est chez les ovins que le virus FVR a été isolé dans la plus forte

proportion (47% des échantillons prélevés); un seul isolement a pu être réalisé chez les autres espèces soumises à l'enquête, soit chez une vache, un chameau, une chèvre, un cheval et un rat. Le virus FVR a fait l'objet, apparemment pour la première fois, d'un isolement répété chez le chameau et chez le cheval.

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