

Bluetongue in camels : a serological survey of the one-humped camel (*Camelus dromedarius*) in the Sudan

by E. M. E. ABU ELZEIN

The Central Veterinary Research Laboratories Al Amarat, P.O. Box 8067, Khartoun, Sudan.

RÉSUMÉ

ABU ELZEIN (E. M. E.). — Fièvre catarrhale du mouton chez le dromadaire du Soudan (*Camelus dromedarius*) : enquête sérologique. *Rev. Elev. Méd. vét. Pays trop.*, 1985, 38 (4) : 438-442.

Une enquête sérologique utilisant la technique d'immuno-diffusion en gélose pour la détection des anticorps spécifiques du groupe a été réalisée sur 445 sérums de dromadaire récoltés dans diverses régions du Soudan où l'élevage camelin est développé.

La prévalence des anticorps anti-BT varie de 0 à 40,2 p. 100 selon les localités, avec une moyenne de 16,6 p. 100. Les taux les plus élevés ont été enregistrés dans les régions de l'ouest et du centre du Soudan où la fièvre catarrhale est connue pour y être endémique.

Un pourcentage relativement faible a été noté dans la partie orientale du pays.

Des études complémentaires sont proposées afin d'élucider le rôle exact des dromadaires dans l'épidémiologie de la fièvre catarrhale.

Mots clés : Dromadaire - Fièvre catarrhale du mouton - Soudan.

SUMMARY

ABU ELZEIN (E. M. E.). — Bluetongue in camels : a serological survey of the one-humped camel (*Camelus dromedarius*) in the Sudan. *Rev. Elev. Méd. vét. Pays trop.*, 1985, 38 (4) : 438-442.

A serological survey for bluetongue (BT) group-specific antibodies, employing the micro agar gel immuno-diffusion (AGID) test was carried out on 445 camel serum samples collected from the various regions of camel breeding in the Sudan. Prevalence of BT antibody varied from 0 to 40.2 p. 100 of the samples from the various localities, with a total prevalence of 16.6 p. 100. The highest prevalence rates were recorded in Western and Central Sudan, which are known to be endemic with BT. A relatively low incidence was recorded for samples from the Eastern region.

Future studies to elucidate the exact role of camels in the epidemiology of BT in the Sudan have been proposed.

Key words : Dromedary - Bluetongue - Sudan.

INTRODUCTION

Scrutiny of the literature reveals that very little information is available regarding the viral diseases of the camel (8). Camels seem to be resistant to a wide range of viral diseases of ruminants (11, 12). However, antibodies against some viral diseases were detected in their sera without showing symptoms of the disease (11).

In the Sudan, camels are reared north of latitude 10° N in the savannah and semi-desert

parts of the country (Fig. 1), and mostly distributed in the regions of Western Sudan, Butana (Central Sudan) and the Eastern region.

In spite of the intimate contact between camels and other ruminants in the country, to our knowledge, none of the animal viral diseases which are endemic in the Sudan was ever reported in the camel. The present study was undertaken to examine whether camels in the Sudan have been exposed to BT virus infection and what role they might play in the epidemiology of the disease.

FIGURE 1 : THE SUDAN

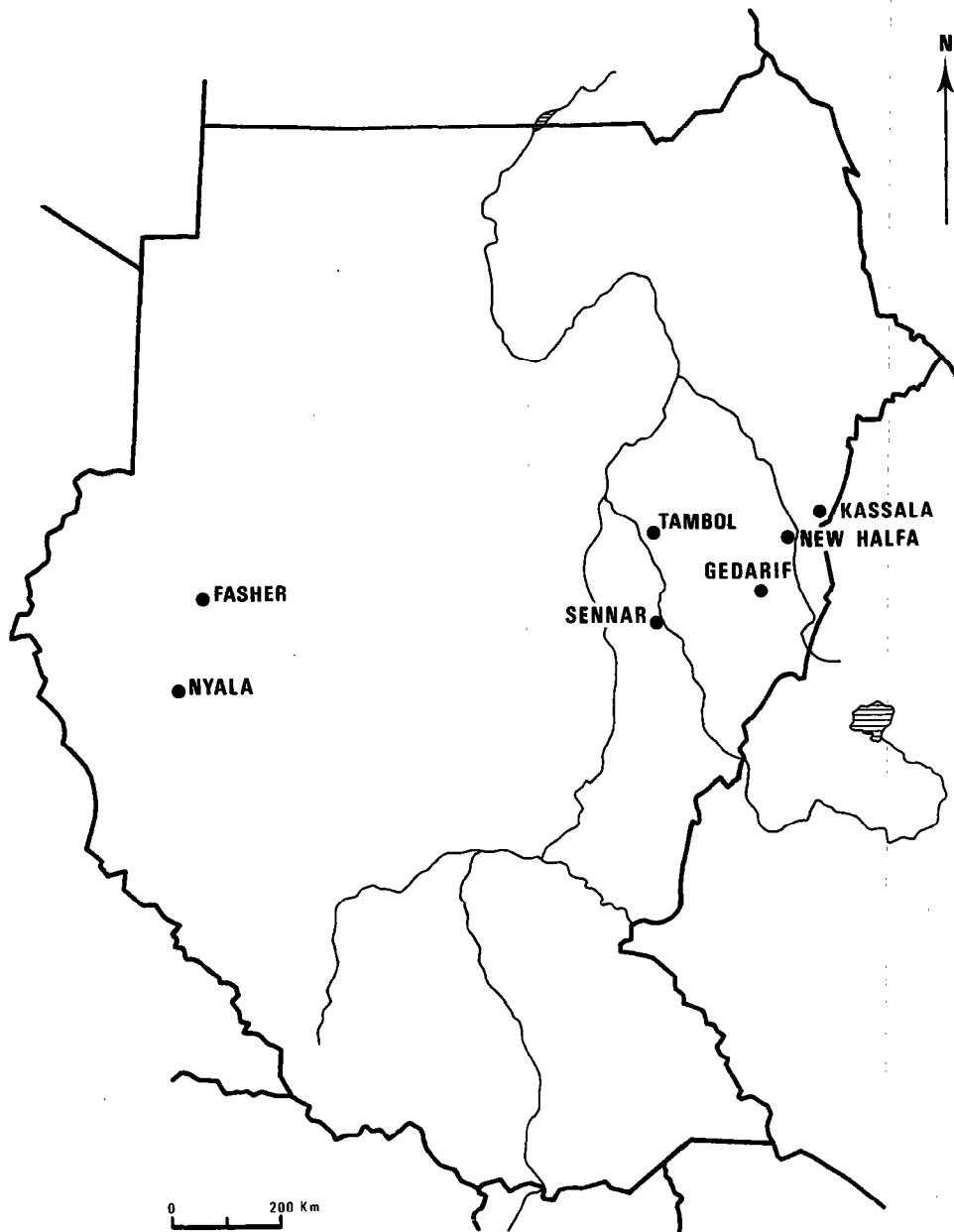


Fig. 1. — Map of the Sudan showing the localities from which sera were collected.

MATERIALS AND METHODS

Reference BT antigen and antiserum

BT virus soluble antigen of type 4 and group specific antiserum obtained from sheep infected with BT virus, type 4, were kindly supplied by

Dr W. TAYLOR of the A.V.R.I., Pirbright, United Kingdom.

Test serum samples

These were collected from apparently healthy adult camels (> 3 years) from El Fasher,

Nyala, Kassala, New Halfa, Gedarif, Tambool, and Sennar. Sera from the 6 former localities were collected from range camels but the sera from Sennar were obtained from Eastern Sudan camels which had been slaughtered in the abattoir (Fig. 1).

The agar gel immunodiffusion (AGID) test

The micro AGID test was carried out using microscope slides. The test pattern consisted of 6-well rosette around a central well. Each well was 5 mm diameter with a distance of 7 mm between the middle of the central well and middle of the peripheral wells of the rosette. Using capillary tubes, the reference soluble antigen was placed in the central well. Test camel sera were added to alternate wells of the rosette, and the reference sheep serum to the remaining wells. Slides were placed in a humid chamber overnight at room temperature. Appearance of precipitin lines was recorded.

RESULTS

Table n° I shows the AGID results on the camels sera. The highest incidence of BT antibodies was in El Fasher followed by Nyala, Tambool, New Halfa, Kassala, Gedarif, and none was detected at Sennar. The total incidence was 16.6 p. 100.

DISCUSSION

BT virus has repeatedly been isolated from clinical cases in sheep from various geographical regions of the Sudan (2, 4, 5, 7). The virus was also isolated from apparently healthy cattle (3). In addition, establishment of the virus in the culicoides population in the country has been recorded (10). In spite of this, clinical BT infection has never been reported in camels. The present study is the first BT serological survey on camels from the Sudan and elsewhere.

Results showed that 16.6 p. 100 of the camels examined had group-specific antibodies against the BT virus. This indicates that camels in the Sudan do undergo some form of BT infection which could be cryptic. However, the extent of infection seems to be far less than that reported in a recent serological survey for other ruminants in the country (6), where 92.7 p. 100 cattle, 86.3 p. 100 goats and 72.8 p. 100 sheep had BT group-specific antibodies. This may probably indicate less susceptibility of the camel to BT virus infection as compared to other ruminant species in the Sudan.

Camels in the Sudan are exclusively reared under nomadic range conditions. Thus, they are in the continuous move for pastures and water. In the Western region, they move northwards in autumn and southwards in the dry season. In Central and Eastern Sudan, camels' movement is mainly towards the open plains during

TABLE N°I-The AGID results for presence of BT antibodies in the camels sera

Locality	Number positive	Number negative	Percentage positive	Total Nb. examined
El Fasher	^o 39 (16.13) ^e	58 (80.87)	40.2	97
Nyala	20 (17.29)	84 (86.71)	19.2	104
Tambool	6 (7.48)	39 (37.52)	13.3	45
New Halfa	4 (7.65)	42 (38.35)	8.7	46
Kassala	1 (3.82)	22 (19.18)	4.3	23
Gedarif	4 (18.29)	106 (91.71)	3.6	110
Sennar	0 (3.33)	20 (16.67)	0	20
Total	^o 74	^o 371	^o 16.6	445

^o = Observed values; ^e = Expected values; Standard deviation for positives = 14.2; Standard deviation for negatives = 32.0.

Calculated Chi Squared (χ^2) = 61.85; χ^2 from table = 22.46 at probability 0.1 (indicating that regional differences are significant).

autumn and towards the river banks and other water centres in the dry season.

The highest incidence of BT antibodies was detected in camels from Dar Fur region, Western Sudan (El Fasher Nyala), followed by camels from Tambool (Central Sudan) and the lowest was in Eastern Sudan (Kassala, Gedarif and New Halfa) and none was detected in camels from Sennar.

The high positive rate seen in camels from the Western region was not unexpected as that region is known to be highly endemic with BT, where in the mid-seventies severe devastating BT outbreaks caused great losses in sheep (7). Equally, the serological surveys for goats, cattle and sheep in that region revealed high BT positives e.g. 91.4 p. 100 for goats, 90 p. 100 for cattle and 40 p. 100 for sheep (6).

Camels from Central Sudan gave higher positives than those from the Eastern region. This could be due to the fact that the Eastern region is drier than the Central region where animals have more access to rivers and other water sources. Nevertheless, the first record of clinical BT in the country was made in the Central region (5) confirming the epidemicity of that region with BT.

The reason why camels from Sennar had no antibodies to BT, could probably be due to the fact that camels are not usually reared in that area, and those camels examined from Sennar in this survey, were slaughter animals which were brought from Eastern Sudan. Thus, such a result was not unexpected as camels from Eastern Sudan generally showed low BT antibody incidence in this study.

The high seroconversion rate to BT virus in domestic ruminants in the Sudan (1, 6, 7), and in the present one, imply that the BT vectors are widespread in the country.

In conclusion, the nature of the BT infection in the camel along with its role in the epidemiology of the disease in the Sudan should be unfolded through further pathogenicity and carrier state studies.

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RESUMEN

ABU ELZEIN (E. M. E.). Lengua azul en el dromedario del Sudán : encuesta serológica. *Rev. Elev. Méd. vét. Pays trop.*, 1985, **38** (4) : 438-442.

Se efectuó una encuesta serológica al utilizar la técnica de inmunodifusión en gelosa para la detección de anticuerpos específicos del grupo en 445 sueros de dromedarios de diferentes regiones de cría del Sudán.

La prevalencia de los anticuerpos anti-BT varía de 0 a 40,2 p. 100 según los lugares, con un termino medio de

16,6 p. 100. Se notaron las tasas más elevadas en las regiones del oeste y del centro del Sudán donde se conoce la lengua azul como endémica. Se observó un porcentaje relativamente poco elevado en la parte oriental del país.

El autor propone estudios complementarios a fin de determinar el papel exacto de los dromedarios en la epidemiología de la lengua azul.

Palabras claves : Dromedario - Lengua azul - Sudán.

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