Communication

First report on the isolation of *Brucella abortus* biovar 3 from camel (*Camelus dromedarius*) in the Sudan

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AGAB (H.), ABBAS (B.), EL JACK AHMED (H.), MAOUN (I.E.). Premier cas d'isolement de *Brucella abortus* biovar 3 sur le dromadaire (*Camelus dromedarius*) au Soudan. *Revue Élev. Méd. vét. Pays trop.*, 1994, **47** (4) : 361-363

Trois isolats de *Brucella abortus* biovar 3 ont été prélevés sur 38 échantillons différents provenant de dromadaires (*Camelus dromedarius*) laissés en pâture libre dans le Soudan oriental. Les caractéristiques chimiques des isolats ont été identiques à celles des autres types de *B. abortus*, sauf la réaction à l'oxydase qui était négative.

Mots clés : Dromadaire - *Camelus dromedarius* - *Brucella abortus* - Analyse microbiologique - Soudan.

Introduction

Several workers have reported on the occurrence of brucellosis among camels in the Sudan based mainly upon serological procedures (1, 2, 4, 7, 13, 15). The prevalence varies from 1.7 % (13) to 7.5 % (2). No record exists of the bacteriological isolation or identification of the *Brucella* species responsible for the seropositive state in camels in the Sudan. However, ABU DAMIR *et al*. (3) have demonstrated its susceptibility to experimental infection with different *B. abortus* strains, including the vaccinal strain (B19), and successfully re-isolated the organisms from experimentally inoculated camels. This communication reports, for the first time, the isolation of *B. abortus* biovar 3 from naturally infected dromedary camels in Sudan.

Materials and Methods

Source of samples

Samples used for the isolation of *Brucella* were obtained from living as well as abattoir camels. The animals belonged to different herds and were raised mainly under extensive pastoralist conditions in the Butana region of Eastern Sudan. These animals were selected for the diagnosis of brucellosis on the basis of suspicious or suggestive signs such as infertility, unthriftiness, chronic locomotor disturbances, history of abortion, presence of hygromas or testicular lesions. In addition, 84.2 % of these animals were brucellosis seropositive (table I).

Serological procedures

Blood was collected by jugular venipuncture. Sera were separated and tested immediately for *Brucella* antibodies using the Rose Bengal Plate Test (RBPT) (6) (antigen obtained from the National Veterinary Services Laboratories, Ames, Iowa, USA). For the abattoir samples, the seropositive camels were identified and their tissues were sampled (supramammary lymph nodes from the females; inguinal lymph nodes and testicular tissues from the males). These tissues were frozen and transported to the laboratory for culture. All the seronegative camels were excluded from the culture trials.

Bacteriological methods

Tissues were crushed in sterilized glass mortar and macerated in sterile normal saline. Aliquots of 0.1 ml of tissue-free homogenate were streaked on several plates of serum dextrose agar (SDA) supplemented with Antibiotic Supplement-Brucella (Oxoid, England). The plates were incubated at 37°C in a 10 % carbon dioxide atmosphere and examined daily for 10 days for the presence of *Brucella* organisms. About 15 ml of milk from each camel cow were centrifuged at 1,500 g for 15 min and 0.1 ml of the sediment and cream were smeared on SDA plates. Vaginal swabs were smeared on the plates immediately after collection. The number, type of samples and serological status of animals tested for isolation are given in table I. Colonies resembling *Brucella* species were selected and identified as described by ALTON *et al* (6).

Results

Brucella-like organisms were observed in three samples 3-5 days after incubation of the plates inoculated with a suspension of one supramammary lymph node, one inguinal lymph node and one of the three vaginal swabs. These cultures showed confluent growth on SDA media. They were 0.5-1.2 mm in diameter and non-haemolytic on blood agar culture media. They had a moist surface and were translucent, being blue in colour when examined against indirect sunlight. Other morphological and biochemical features of the isolates were identical to those of the species *Brucella abortus* except that our isolates were oxidase negative. However, cultures made from milk samples (n = 22), testicular tissues (n = 5) and the single synovial fluid yielded negative results. The 3 isolates were biotyped as *B. abortus* biovar 3 at the Centre national d'Etudes vétérinaires et alimentaires, Maisons-Alfort (France).

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TABLE I Number, type of samples and serological status of animals tested for the isolation of **B. abortus.**

Sample	No.	Sex	Source		RBPT*	
			Living	Abattoir	Positive	Negative
Milk	22	Females	+		16	6
Supramammary lymph node	2	Females		+	2	0
Inguinal lymph node	5	Males		+	5	0
Testicular tissues	5	Males		+	5	0
Vaginal swab	3	Females	+		3	0
Synovial fluid	1	Females	+		1	0
Total	38				32 84.2 %	6 15.8 %

* *RBPT = Rose Bengal Plate Test.*

Discussion

Brucella abortus and *Brucella melitensis* have been isolated from different animal species in Sudan with the exception of the camel (8, 11, 12). Knowledge of the *Brucella* species responsible for the disease and their biovars in a certain country or region is of essential epidemiological importance for the control and eradication of brucellosis. Although it had been indicated that *Brucella* organisms could be isolated from camel milk (9), our attempts, together with those of AL KHALAF and EL KHALADI (5), to isolate this pathogen from camel's milk were not successful.

Doubt was also cast on the report by ABU DAMIR *et al.* (3) of the shedding of this organism in camel's milk even after experimental infection. These findings might support the conclusion of McGRANE and HIGGINS (10) about the rather difficult isolation of *Brucella* from camels in contrast to other animal species.

Brucella abortus biotypes previously isolated from cattle in Sudan were designated biovar 6 from Western Sudan (12) and biovar 3 from Central and Eastern Sudan (MAMOUN *et al.*, unpublished data). On the other hand, biovars of *Brucella* organisms isolated from some camel-raising countries include *Brucella abortus* biovars 1 and 3 from Senegal (14), *Brucella melitensis* biovars 1 and 3 from Iran (16) and *Brucella melitensis* biovar 1 from Kuwait (5). It is worth mentioning that both isolates of *Brucella abortus* biovar 3 from Sudan and Senegal were the only oxidase negative biovars recorded in the literature.

The isolation of *B. abortus* biovar 3 from camels in this study could indicate the cross-transmission of *Brucella* between different animal species in Eastern Sudan, although the number of samples tested was quite small. However, further studies on the aetiology of camel brucellosis are required particularly in other areas of high camel population in Sudan.

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Three isolates of *Brucella abortus* biovar 3 were recovered out of 38 different samples obtained from free-ranging camels (*Camelus dromedarius*) in Eastern Sudan. The biochemical characters of the isolates were identical to those of the other types of *B. abortus* except that they were oxidase negative.

Key words : Dromedary - *Camelus dromedarius* - *Brucella abortus* - Microbiological analysis - the Sudan.