INVESTIGATIONS ON A NEW PATHOLOGY OF CAMELS (*CAMELUS DROMEDARIUS*) IN ETHIOPIA

Roger F, Libeau G[1], Yigezu LM[2], Grillet C[1], Sechi LA[3], Mebratu GY[2], Diallo A[1].

[1]CIRAD-EMVT, Animal Health Program, BP 5035, Montpellier, France, 34032
[2] National Veterinary Institute, PO Box 19, Debre-Zeit, Ethiopia
[3] Università degli studi di Sassari, Viale S. Pietro 43/B, Sassari, Italy, 07100

A new epizootic disease has substantially affected the camel population in Ethiopia from May 1995 until September 1996. It was an acute febrile infection characterized by respiratory syndrome, highly contagious, with elevated morbidity and low mortality rates, especially following antibiotic treatment (1, 6, 7).

In a period less than 12 months, the disease was registered in most camel rearing areas of the country. The morbidity rate notified was over 90 %, the mortality rate varied from 5 to 70% and differed in accordance to the areas and to antibiotic treatment practice.

We have communicated informally with Veterinary personnel in Djibouti who informed us about the similar camel disease incidence in their country and even in the neighboring Somalia. Outbreaks were notified in Eritrea in 1995. In Sudan, similar pathology (named “trekking fever”) had been described in 1994, in the Kassala region.

Following a sudden onset, the major symptoms are sero-muco-purulent nasal discharge, lacrimation, productive coughing, dyspnea and abdominal breathing, with elevated body temperature (41-42°C). Swelling of sub-mandibular area and diarrhea have been recorded in some cases. In one to two weeks from appearance of the initial symptoms, animals get depressed, lie down and are incapable to move. All ages and sex groups are affected. Neurological signs (paralysis) have been observed in certain herds that previously manifested respiratory syndrome.

The high prevalence of the Peste des Petits Ruminants (PPR) in small ruminants in the epidemic area, as well as the appearance of similar symptoms with a rinderpest-like disease, its remarkably rapid spread and its pathology, has prompted us to search for a viral disease and specially for morbillivirus as primary etiologic agent

Proceedings of the 9th International Symposium on Veterinary Epidemiology and Economics, 2000
Available at www.sciquest.org.nz

Materiel and Methods

ELISA Antigen test for PPR virus (PPRV) and rinderpest Virus (RPV) was completed in Ethiopia and afterwards in CIRAD-EMVT, France. RT-PCR, utilizing primers for morbillivirus group and then for PPRV and RPV, was carried out and followed by a sequencing. Goats and sheep have been inoculated by the camel samples. A competitive-ELISA antibody test was applied on serum samples from three epidemiological defined regions. Bacteriological works were carried out handling different culture media (2, 3)

Results

The detection of PPRV antigen by ELISA test (1, 5) and PPR antibodies (1, 5) revealed the presence of morbillivirus strains. The finding of PPRV genomes by RT-PCR (2) showed the occurrence of 2 strains which are closely related to the PPRV. These two strains fitted into two provisional genetic groups (figure 1).

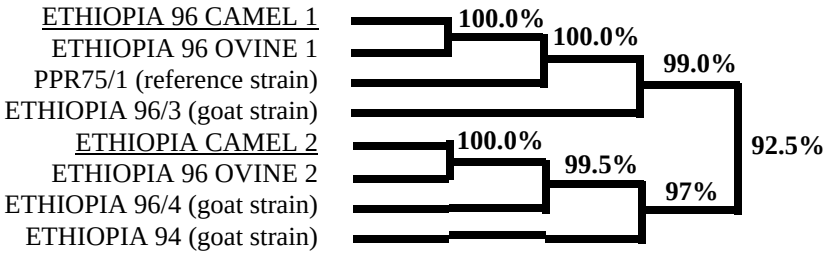

Figure 1: Comparison of the sequences of the different Ethiopian PPRV strains.

Inoculated small ruminants shown the following symptoms: eye congestion, hyperemia at the base of the teeth and diarrhea for the sheep. PCR tests detected PPRV strain on lungs and lymphocytes (7).

The ELISA results are summarized in the table 1.

Camel group	non affected	sick	convalescent
Sample size	17	47	26
Percent. of positive	0%	6,4%	15,4%
Mean* for all samples**	0.247	0.323	0.391
Variance for all samples***	0.013	0.011	0.017
Minimum	0.000	0.095	0.195
Maximum	0.435	0.525	0.690
Mean for positives samples	-	0.513	0.619
Variance for positives samples	-	0.0002	0.007

*The threshold value is 0,5 **ANOVA: $F=8.14$; $p<0.001$ ***variances are homogeneous with 95 % confidence (Bartlett's test for homogeneity).

Table 1: values of competition among the three groups for PPR antibodies (N-protein).

We observed an increase in the sero-prevalence rates from the first group (non affected) up to the third (sampling one month after the end of disease) with intermediate results for the second group including sick animals (5).

Streptococcus equi subsp. *equi* was isolated from few camels. It was apparently the first isolation of the Strangles agent from camel (3, 4).

Discussion

It is assumable that the outbreak could have been initiated by a morbillivirus closely related to the PPR virus. The symptoms which were observed during that outbreak were milder than those of classical PPR in sheep and goats. This might be due either to the involvement of a mild strain or to the fact that camels are less sensitive to PPRV than small ruminants. Even in goats species which are known to be very sensitive to PPRV, there is variation in the sensitivity according to the breed. The virus might have an immuno-suppressor consequence. That could have favored the pathogenicity of the secondary bacterial infections that had been effectively treated by antibiotics and reduce considerably the mortality rate (6, 7). The precise role of the *Streptococcus* sp. has to be determined. Surveillance of this pathology and more accurate epidemiological and microbiological investigations are required.

Reference

1. François Roger. French Veterinary Project in Ethiopia. Statement 1997. Report CIRAD-EMVT N°97041. December 97.

2. Adama Diallo. Projet "épidémiologie de la peste bovine et de la peste des petits ruminants à partir de données de biologie moléculaire. Rapport scientifique. 1996. Contrat EU n° TS3-CT93-0204. 34 pp.

3. Laike Mariam Yigezu, François Roger, Martine Kiredjian, SelamTariku. Isolation of *Streptococcus equi* subspecies *equi* (strangles agent) from an Ethiopian camel. Veterinary Record 1997; 140: 608.

4. Leonardo A. Sechi, François Roger, Adama Diallo, Laike Mariam Yigezu, S. Zanetti S. Molecular characterization of Streptococcus equi subspecies equi isolated from an Ethiopian camel by ribotyping and PCR-ribotyping. New Microbiol. 1999; 22 (4): 383-7.

5. François Roger , Guebre Yesus Mebratu, Geneviève Libeau, Adama Diallo, Laike Mariam Yigezu, Yilma Tilahun. Rinderpest and PPR antibodies in Ethiopian dromedaries (submitted for publication).

6. François Roger, Laike Mariam Yigezu, Corinne Hurard, Geneviève Libeau, Guebre Yesus Mebratu, Adama Diallo, Bernard Faye. Preliminary results presented at the Third Annual Meeting For Animal Production Under Arid Conditions. Camel Production and Future Perspectives - Al. Aï n - 2nd-3th May, 1998.

7. François Roger, Laike Mariam Yigezu, Corinne Hurard, Geneviève Libeau, Guebre Yesus Mebratu, Adama Diallo, Joseph Domenech. Preliminary results presented at the 9th AITVM Conference in Harare, 14th-18th September, 1998.