Bovine and human brucellosis in The Gambia: First characterisation of *Brucella* isolates

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INTRODUCTION

Studies in the Western Region (WR) of The Gambia reported the consumption by the population of raw milk from cows showing clinical signs of brucellosis such as carpal hygroma. Serological studies in either cattle or people had never been undertaken. The objectives of this study were the following: Determination of the prevalence of bovine brucellosis in the WR, investigation of human brucellosis in selected villages, and isolation and characterisation of *Brucella* spp.

MATERIAL AND METHODS

Data collection

For the bovine brucellosis study, 2233 serum samples were collected from 96 cattle herds in four districts (Kombo districts) of the WR.

For the human brucellosis investigation, 509 serum samples were obtained in 5 villages with serologically positive herds. A total of 207 people from 41 different families or households of shepherds and herd owners, considered the high risk population, being more exposed to infected animals and contaminated milk, and 302 volunteers among the inhabitants of the villages, considered as less exposed, were included in the study.

Six hygroma fluid samples were also collected from animals wearing carpal hygroma in one herd.

Serology

A multi-testing approach comprising Rose Bengal Test (RBT), indirect Enzyme-linked ImmunoSorbent Assay (iELISA) and the micro-method of the Slow Agglutination Test with EDTA (SAT-EDTA) was applied to the 2233 bovine and 509 human sera.

Isolation and characterisation

Hygroma fluids samples were cultured and the *Brucella* isolates identified and biotyped with the traditional method (Alton et al., 1988).

The DNA obtained from the isolates was used for the molecular typing using the 15 Multiple Loci Variable Number of Tandem Repeats Analysis (MLVA-15).

RESULTS

Table 1 Results of the serological testing

	Number of positives and proportion (%)				
	RBT	ELISA	SAT-EDTA	Tests in series	Tests in parallel
Cattle	83 (3.37)	110 (4.63)	69 (2.80)	64 (2.51)	118 (4.97)
Human	2 (0.39)	1 (0.19)	1 (0.19)	0	3 (0.59)

- **Herd seroprevalence rates were 16.14% (tests in series) and 26.59% (tests in parallel).**
- **With a Bayesian model, the true prevalence of bovine brucellosis was estimated at 1.17%**
- **In the human survey 99.6% of people sampled used to drink raw milk. Two out of the three positive cases were shepherds.**

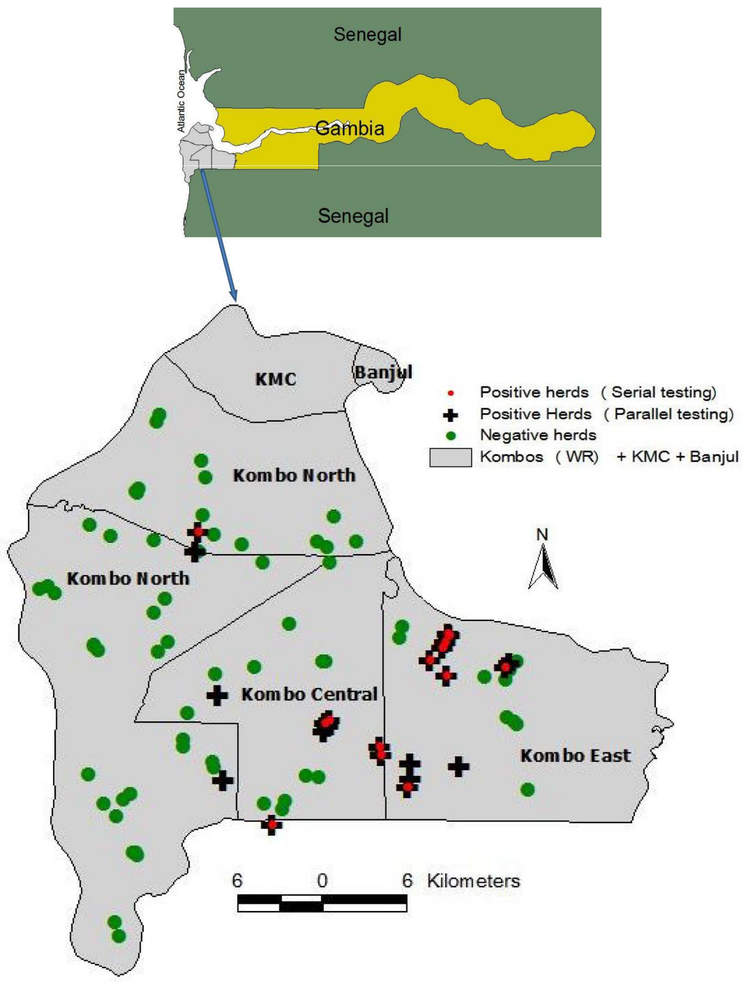

Fig. 1 Spatial distribution of negative and positive herds

Out of the 6 hygroma fluid samples cultured, 3 isolates of *Brucella* were obtained. All the isolates were biotyped as *B. abortus* biovar 3.

This result was confirmed by the MLVA which gave the same profile for the 3 isolates indicating probably the same source of infection.

The MLVA profile from panel 1 markers is shared with reference and field strains Ref Tulya, BCCN 93_26 and BfR 8 in "*Brucella2009* public database" (Fig. 2).

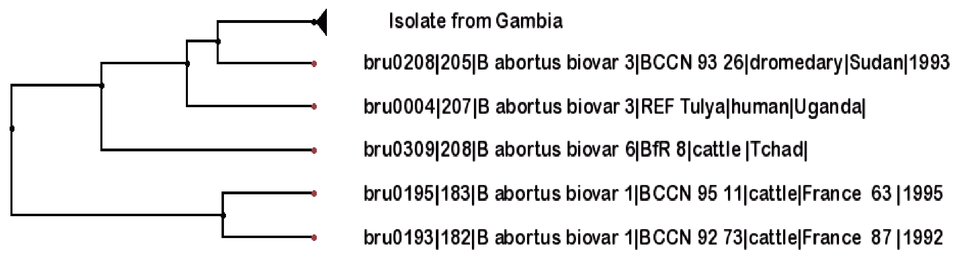

Fig. 2 Dendrogram showing the relationship between the isolates and field and reference strains based on MLVA profiles given by panel 1 markers

CONCLUSION

- **Many herds in WR were still infected and could be a real risk not only for farmers and people who have close contact with the infected animals (butchers, veterinarians…), but also for consumers of animals products (unpasteurized milk, cheese, butter from fresh milk…).**
- **The investigation on human brucellosis showed a very low seroprevalence in villages where many cases of seropositive cattle were found. The few cases diagnosed were mostly related to close contact with infected animals. Raw milk consumption seemed to have less epidemiological importance.**
- ***B. abortus* biovar 3 is common in the sub-region and only molecular techniques could allow discriminating between strains from different locations within the framework of a coordinated eradication programme.**

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