

## Observation on the outbreak of lumpy skin disease in Ethiopia

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### RÉSUMÉ

MEBRATU (G. Y.), KASSA (B.), FIKRE (Y.), BERHANU (B.). — Observation sur les cas de dermatose nodulaire des bovidés en Ethiopie. *Rev. Elev. Méd. vét. Pays trop.*, 1984, 37 (4) : 395-399.

La dermatose nodulaire des bovidés a été observée de 1981 à 1983 dans les régions ouest, nord-ouest et la partie centrale de l'Éthiopie. La morbidité atteint 30 p. 100 alors que la mortalité n'est que de 0,5 p. 100. Le diagnostic de la maladie a été fait à partir des observations cliniques, de l'isolement et de l'identification de l'agent viral, y compris la microscopie électronique.

La technique de séroneutralisation croisée entre les trois souches isolées a montré leur identité. L'emploi du vaccin contre la clavelée a été efficace dans le contrôle de la maladie.

*Mots clés* : Dermatose nodulaire - Bovins - Ethiopie.

### SUMMARY

MEBRATU (G. Y.), KASSA (B.), FIRKE (Y.), BERHANU (B.). — Observation on the outbreak of lumpy skin disease in Ethiopia. *Rev. Elev. Méd. vét. Pays trop.*, 1984, 37 (4) : 395-399.

Lumpy skin disease was observed in the years between 1981 and 1983 in the North Western, Western and central regions of Ethiopia. The morbidity rate reached 30 p. 100 with a mortality rate of 0.5 p. 100. The disease was diagnosed on clinical observation, isolation and identification of the viral agent and on electron microscopy. Cross neutralization test between the three isolates was done and they were all found to be identical. The application of sheep pox vaccine had been proved to be efficient in controlling the disease.

*Key Words* : Lumpy skin disease - Cattle - Ethiopia.

### INTRODUCTION

Lumpy skin disease is an infectious viral disease of cattle caused by parapoxvirus (*poxviridae*) and characterized by the formation of nodules on the skin accompanied by oedema and fever. It causes loss of weight, poor milk production and reduces the quality of the hide.

The disease is known to exist in the continent of Africa for many years (3). It had been recognized in East Africa since 1957. It was declared in the Sudan in 1971, in Niger and Chad in 1973, Nigeria in 1974.

Its epizootic characteristics is highly associated with climatic conditions, mainly prolonged

and heavy rains which favours an increase of the population of vectors. (biting insects).

The mortality rate so far reported from different african countries varried remarkably. In Kenya, it had been 1.2 p. 100 (AYRES SMITH 1960), whereas in South Africa and Sudan it reached 75-90 p. 100 (2, 6).

The viral strains of lumpy skin disease isolated in many countries were indistinguishable by serology (5, 8).

Moreover the virus of lumpy skin disease cannot be differentiated from sheep and goat pox by conventional serum neutralization tests in tissue culture or by fluorescent antibody tests (5).

The recent outbreak of the disease is wide spread in the western and northern regions of Ethiopia with a tendency of spreading East wards. The morbidity rate reached 30 p. 100 in indigenous Zebu breed with a mortality rate not passing 0.5 p. 100.

### MATERIALS AND METHODS

Cases of lumpy skin disease were examined in northern western regions of Gojjam and

Gondar, in the western region of Wollega and in Shoa region between the years of 1981 and 1983. In all instances, affected cattle manifested the clinical symptoms of lumpy skin disease with the characteristic skin nodules ranging from 0.5 to 5.0 cm in diameter. The nodules were hard and firm to cut. In some cases, they were profuse. It has been observed that the whole body was covered with nodules. The other common signs of the disease had been a rise in body temperature, oedema of the leg and swelling of prescapular lymph

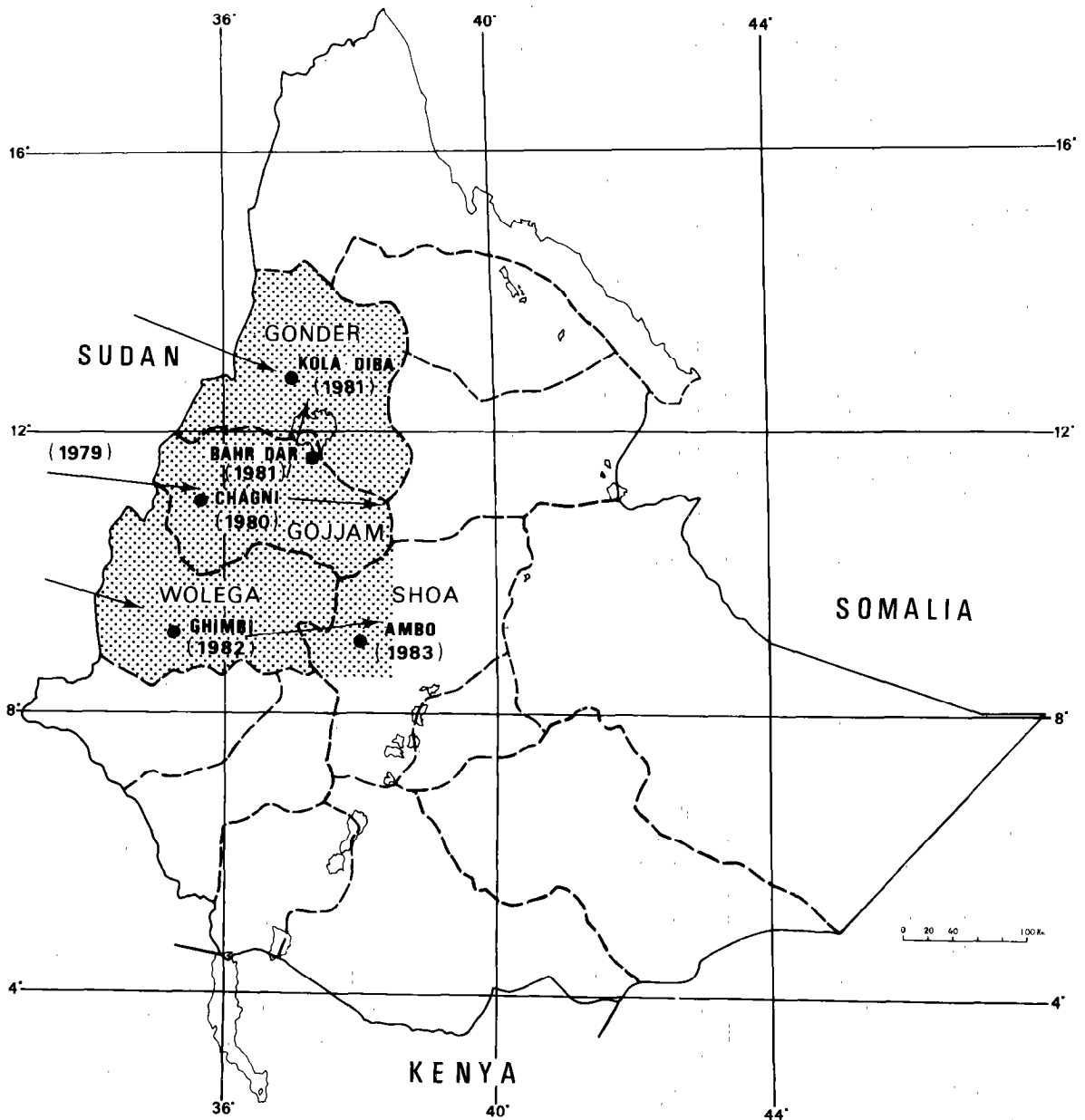




Photo 1. — Nodules on the belly of the animal.



Photo 2. — Generalised eruption of skin nodules.



Photo 3. — Necrosis of the nodules.

nodes. The dewlap, the brisket, the belly and the udder were found to be swollen in some animals.

Skin nodules of affected animals and sera from sick and recovered ones were the source of material for the detection of the viral particles and the presence of antibody. Sera from sheep pox vaccine vaccinated cattle helped in studying the cross protection of cattle against lumpy skin disease.

Calf kidney primary cell culture and Vero cells were used for the isolation of the virus and the seroneutralization tests. The culture media for Vero cells was Stocker and for the calf kidney cells Hanks media supplemented by 2.5 p. 100 lactalbumin hydrolysate.

The May grünwald giemsa stain was applied to localise the inclusion bodies.

#### — Ether sensitivity test

Ether sensitivity test was done on the viral isolates in such a manner that the viral suspension was mixed with an equal volume of ether ethanol and left for 60 min at + 4 °C. The ether treated suspension was incubated into test tubes with cell culture.

#### — Seroneutralization test

Seroneutralization test on sera collected from hyperimmunized rabbits, on sera from healthy, sick and recovered as well as from sheep pox vaccine vaccinated cattle was done against the viral isolates of lumpy skin disease.

#### — Electron microscopy

Negative staining of the viral isolate of Bahrdar was done. A seroneutralization test using a reference serum was conducted in France by I.E.M.V.T. to confirm the existence and the identity of the virus.

## RESULTS

A cytopathic effect (CPE) was observed in primary calf kidney and Vero cell culture from 5 to 11 days after inoculation with a 10 p. 100 W/V suspension of skin biopsy. The culture media was supplemented with 2.5 p. 100 lactalbumin hydrolysate.

The cytopathic effect was characterized by the gradual destruction of cell monolayer. Infected cells were round and formed aggregates. Complete destruction of the cell sheet was seen by 10-11 days of inoculation.

Intracytoplasmic eosinophilic inclusion bodies were observed in infected cells on cover slides.

Complete inhibition of the cytopathic effect was noticed after treating the viral suspension with ether.

#### Comparison of different isolates of lumpy skin disease virus.

The inter relationship of the three isolates of lumpy skin disease virus (Ghimbi, Ambo and Bahrdar) was quantitated by the cross neutralization test against 100 TCID<sub>50</sub>/ml of the respective strains. They all proved to be identical.

A serological survey of cattle in the affected areas revealed that recovered animals were having an antibody titer of 512 against 100 TCID<sub>50</sub>/ml of the lumpy skin disease virus of Bahrdar strain.

Sera collected from cattle vaccinated with sheep pox vaccine (RM 65 strains) 21 days after vaccination indicated a seroneutralization index of log<sub>10</sub> 2.5.

The electron microscopy identification of the viral isolate confirmed its existence in examined material.

## DISCUSSION

There had been indications in the past years on the existence of lumpy skin disease in Ethiopia. But attempts to isolate the virus had never been carried out. Hence this has hindered to reach a final diagnosis and declare the occurrence of the disease.

The present study on the isolation of the virus from affected animals of 3 western and central regions and detection of the antibody on the sera collected confirm the existence of the disease.

The recent course of the disease started from Sudan (1979) and spread eastwards. At present it is reported and confirmed in the central region (Shao) of Ethiopia.

No serological differences was seen between the 3 isolates (Ambo, Ghimbi, Bahrdar). Vaccinating cattle with sheep pox vaccine had given a satisfactory result in the control of the disease.

## RESUMEN

MEBRATU (G. Y.), KASSA (B.), FIKRE (Y.), BERHANU (B.). — Observación sobre los casos de dermatosis nodular de los bovinos en Etiopía. *Rev. Elev. Méd. vét. Pays trop.*, 1984, 37 (4) : 395-399.

Se observó la dermatosis nodular de los bovinos de 1981 a 1983 en las regiones oeste, noroeste y la parte central de Etiopía. Llega a 30 p. 100 la morbilidad mientras que no es más que de 0,5 p. 100 la mortalidad. Se hizo el diagnós-

tico de la enfermedad a partir de observaciones clínicas, del aislamiento y de la identificación del virus, incluyendo la microscopía electrónica.

La técnica de seroneutralización cruzada entre las tres cepas aisladas mostró su identidad. Fué eficaz el empleo de la vacuna contra la viruela ovina para eliminar dicha enfermedad.

*Palabras claves* : Dermatitis nodular - Bovinos - Etiopía.

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