

A Study on the Ultrastructural of Goat Pox in Guizhou, China

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Abstract: The lesions of goat pox in Guizhou province were observed under electron microscopy. The results showed that numerous typical goat poxvirus in different mature stage which were found in the cytoplasm of the affected epithelial cells in skin and lung and some also could be found in the cytoplasm of macrophages.

Key words: Goat pox, ultrastructural, cytoplasm, epithelial cells, macrophages, lung

INTRODUCTION

Goatpox Virus (GTPV) is the causative agent of Goatpox (GP), an acute, contagious and fatal disease which causes considerable economic losses, especially in countries with an industrialized goat production system because the virus infection spreads rapidly worldwide causing high rate of morbidity (Wang *et al.*, 2003).

It had outbreak goat pox since 2002 October in Guizhou province, China, it is very necessary for a correct understanding of goat pox in course of pathological changes. In this study, researchers reported the detail observation on ultrastructural pathological changes in the popular natural case. The results of this study provide some interesting data that may be beneficial to understand the regular distribution pattern and nosogenesis of GTPV in goats.

MATERIALS AND METHODS

The newly formed pox on skin and lung pox were taken from 4 natural diseased goats in Guizhou province. For electron microscopic observation, the skin and lung pox were removed and cut into blocks of 1 mm³ or smaller. The blocks were fixed in 3% glutaraldehyde in 0.1 M sodium phosphate buffer (pH 7.4) at 4°C for 2 h and rinsed overnight in the same buffer containing 8% sucrose. The blocks were then postfixed in 2% OsO₄ in the same buffer at 4°C for 90 min. The specimens were then dehydrated in graded ethanol and embedded in Epon. Ultrathin sections were cut with a Porter-Blum MT-1 ultramicrotome (Ivan Sorvall Inc., Newtown, Conn.) with glass knives, mounted on collodion-coated copper grids, doubly stained with uranyl acetate followed by lead citrate and observed with a Hitachi HU-11 DS electron microscope (Hitachi Co., Ltd. Tokyo, Japan) at an accelerating voltage of 75 kV (Fukuda *et al.*, 1980).

RESULTS AND DISCUSSION

It can be observed a large variety of different mature period of viral particles in the ultrathin sections of skin and lungs. It can be divided into several periods: the early formation of virus particles, a film but sometimes not very full, round, oval or irregular shape, the content of film containing can be divided into a high electron density, uniformity, the film inside a large proportion, similar cells, another is the electronic medium density, uniform, distribution in nuclei around. The formation of the interim of viral particles and an encapsulated, circular or circular structure and the early formation of virus particles are different electronic density material in the smaller percentage of small particle diameter virus. The mature virus particles, its structure is characterized by oval as the main form, electronic density are covered with film which has a dumbbell shaped core in the concave side bodies were seen there, under the electron microscope were randomized to 30 mature goat pox virus particle size were measured its size, average of 310.3-204.6 nm (Fig. 1 and 2).

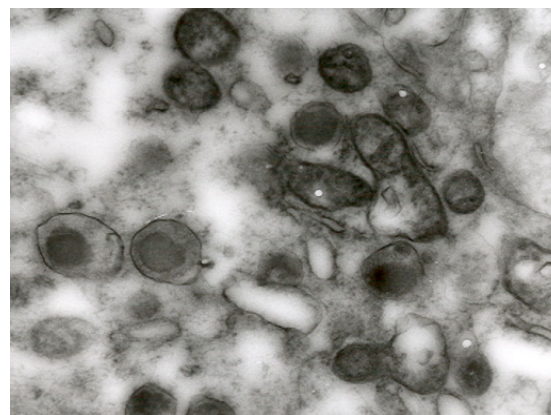


Fig. 1: Different stages of GTPV

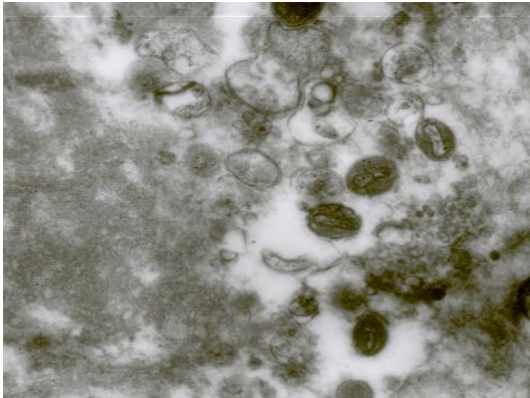


Fig. 2: Mature GTPV

Goat pox virus belongs to the poxviridae capripoxvirus, it is as an ovoid structure, with dumbbell shaped DNA core in the recess in the side bodies exist under the electron microscope (Zhou *et al.*, 2007; Nagpal *et al.*, 1990). This is basically the same with the course of study that observed in infected epithelial cells, fibroblasts, macrophages and other cells within the cytoplasm of the presence of the virus particle morphology.

The ultrastructural pathological changes of natural outbreaks goat pox were studied in detail by transmission electron microscope techniques in Guizhou province for explain the occurrence of the disease. In particular, it has an important significance on the infected epithelial cells, macrophages, lung epithelial cells, endothelial cells and intraluminal viral particles.

CONCLUSION

It had found that goat pox virus infection of epithelial cell cytoplasm cytoplasmic matrix staining pale, electron density decreased, cell organelles are discrete, swelling of mitochondria, endoplasmic reticulum dilation. Goat pox virus infection by intracytoplasmic inclusion bodies are seen in inclusion bodies, there are a large number of virus particles in different mature period. This study supported the reports where the inclusion is the important places on replication of virus (Kitching, 1994; Baxby, 1996).

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MW, CZT, ZDX and YJL carried out most of the experiments and wrote the manuscript and should be considered as first researchers. ZBJ critically revised the manuscript and the experiment design. All of the researchers read and approved the final version of the manuscript.

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