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DHORI VIRUS INDUCED LESIONS IN MICE

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Summary. — Dhori and Thogoto viruses are till now the only recognized tick-borne orthomyxoviruses. Like Thogoto virus, also Dhori is highly hepatotropic for laboratory mice; the lesions in several organs resemble those described for influenza virus.

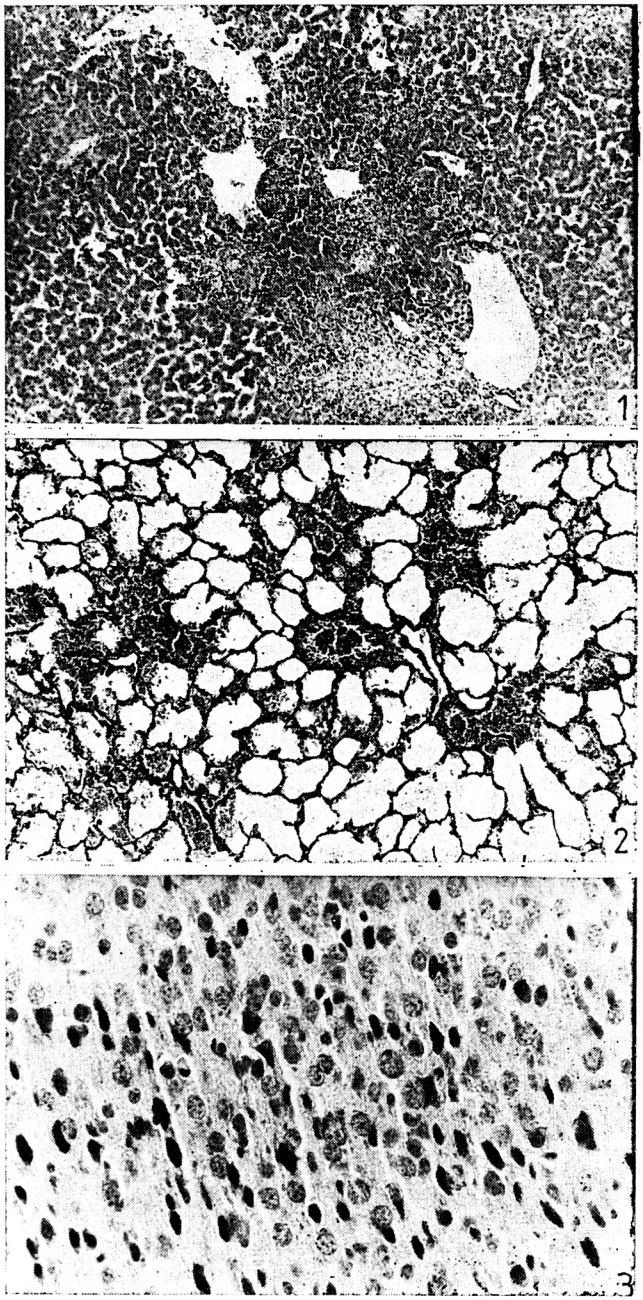
Key words: *Dhori virus*; *tick-borne orthomyxovirus*; *hepatotropic tick-borne virus*; *arbovirus pathogenesis*

Dhori virus was first isolated in Gujarat State, India in 1961 (Andersen and Casals, 1973). Later on it was identified in the U.S.S.R. (Butenko and Chumakov, 1971), in Egypt (Williams *et al.*, 1973), and Portugal (Filipe and Casals, 1979). Dhori and Thogoto viruses were shown to share common structural characteristics of family Orthomyxoviridae (Clerx *et al.*, 1983); until now they are the only viruses recognized and grouped as tick-borne orthomyxoviruses. Previous studies have shown that Swiss albino mice infected with Thogoto virus develop pathological lesions in the liver and intestinal haemorrhages resembling those described for influenza virus (Mims, 1960). While recently several papers have been devoted to Thogoto virus (Davies *et al.*, 1986; Davies *et al.*, 1987) no attention had been paid to another tick-borne orthomyxovirus, the Dhori virus.

In this paper we present pathological lesions observed in mice infected with Dhori virus isolated from ticks in Portugal.

Dhori virus, strain Po ti 461, isolated from *Hylomma marginatum* ticks collected in Vidigueira, 1971, was passaged 14 times by the intracranial (i.c.) route in albino mice (Filipe *et al.*, 1985). Swiss albino mice (Charles River Strain) were obtained originally from the colony of the Instituto Gulbenkian de Ciência, Oeiras, Portugal. Mice 2—4-day-old were inoculated by intraperitoneal (i.p.) route with 5000 Vero cell plaque-forming units (PFU) of the virus. At several intervals post-inoculation (p.i.) the mice were sacrificed and the following organs removed: brain, heart, lungs, liver, spleen, kidney, and intestines. The organs were immediately fixed in 10% buffered formalin. Sections 5 μm thick were cut from the paraffin embedded material and subsequently they were stained with haematoxylin and eosin.

The mice died between 6 and 8 days p.i. At 120 hr p.i., in a single case, haemorrhage of the third ventricle was found. In the lungs a moderate degree of hyperplasia of the interalveolar septa was seen. From 144 hr p.i. onwards, i.e. 168 and 192 hr p.i., the lesions observed were quite similar,



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mainly affecting the liver (Fig. 1) and the lungs (Fig. 2). The brain also seemed to be affected, but not in every case.

In the liver small necrotic foci developed with no particular location in the acini. They showed a moderate and variable degree of cellular infiltration, both mononuclear and polymorphonuclear. At 192 hr p.i. the focal necrosis seemed more extensive but the difference was not significant.

In the lesions observed in the lungs foci of haemorrhage, affecting small groups of alveoli and, occasionally, hyperplasia of the interval septa were seen. The brain lesions 168 hr. p.i. consisted of necrosis of the neurons, either in a diffuse or a focal pattern (Fig. 3).

No lesions were observed at any stage of infection in the intestine, kidney, spleen and heart.

Comparing these lesions with those observed in mice infected with Thogoto virus (Filipe *et al.*, 1985), the liver and the lungs were similarly affected in both cases. However, the onset of the lesions was here delayed by approximately 3—4 days. This is probably related to the fact that Thogoto virus kills the laboratory mice in 3—4 days while the same laboratory animals, when inoculated with Dhori virus, died 4—8 days later under the same conditions. As far as the brain is considered, no necrosis of neurons was reported in the Thogoto inoculated mice, only haemorrhages, while Dhori virus caused brain lesions within 168 hr p.i., which consisted of necrosis of the neurons, either in a diffuse or a focal pattern. On the other hand, the intestine did not seem to be affected by the Dhori virus in contrast to what was noticed with the Thogoto virus.

In both Dhori and Thogoto inoculated animals, no lesions could be detected in the heart, spleen or kidney.

In summary, Dhori virus originated lesions in liver and lung very similar to those found in animals inoculated with Thogoto and influenza viruses.

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Fig. 1. Focal necrosis in the liver of mouse sacrificed 144 hr p.i. (HE × 70).

Fig. 2. Foci of alveolar haemorrhage in the lung of a mouse sacrificed 144 hr p.i. (HE × 70).

Fig. 3. Brain section of a mouse sacrificed 144 hr p.i. showing a pattern of difuse necrosis of neurons (HE × 300).

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