



Cytopathology of *Bombyx mori* (Lepidoptera: Bombycidae) silk gland caused by multiple nucleopolyhedrovirus

R.M.C. Brancalhão^{1,2}, E.F.B. Torquato² and M.A. Fernandez¹

¹Laboratório de Organização Funcional do Núcleo,
Departamento de Biologia Celular e Genética,
Universidade Estadual de Maringá, Maringá, PR, Brasil

²Departamento de Ciências Biológicas e da Saúde,
Laboratório de Biologia Celular e Microtécnica,
Universidade Estadual do Oeste do Paraná, Cascavel, PR, Brasil

Corresponding author: M.A. Fernandez
E-mail: aparecidafernandez@gmail.com

Genet. Mol. Res. 8 (1): 162-172 (2009)
Received October 27, 2008
Accepted November 28, 2008
Published February 17, 2009

ABSTRACT. A multiple nucleopolyhedrovirus previously isolated from infected *Bombyx mori* L. larvae (BmMNPV) in Paraná State, Brazil, was inoculated into *B. mori* larvae to examine susceptibility and cytopathology in silk gland cells. The anterior, middle and posterior silk glands were removed from the infected silkworm at different times post-inoculation and processed for cytopathology studies by light and transmission electron microscopy. BmMNPV infection was only detected at 72 h post-inoculation in cells of the middle and posterior silk glands. No sign of infection was found in the anterior silk gland. Cytopathological characteristics were similar to those found in other target tissues; initially, they consisted of nuclear hypertrophy and the formation of virogenic stroma (viroplasm), in which the progeny virions are produced. The virions are then enveloped and occluded in protein crystal structures, the polyhedra. After viral replication, cells undergo lysis and release a great number of BmMNPV polyhedra into the hemocoel. Histopathology showed early infection foci in regions surrounding trachea

insertions, demonstrating that trachea is an infection-spreading organ in the insect body. Trachea penetrates the middle and posterior silk gland basal lamina, considered a barrier to virus, facilitating the penetration of budded virus. The anterior silk gland does not have tracheal insertions into the basal lamina, which reduces budded virus infection. Tracheal branches provide a conduit for non-occluded virions (budded virus) to pass through the basal lamina barrier and disseminate BmMNPV in the silkworm silk gland.

Key words: *Bombyx mori*; Silkworm; Baculoviridae; Trachea; Silk gland; Infection process