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Short Communication

Histopathological studies of microsporidian infected tissues of Lamerin breed of the silkworm, *Bombyx mori* L.

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Ultrastructure of gut and fat bodies of Lamerin breed of the silkworm *Bombyx mori* L infected with microsporidia did not show hypertropy of cells but structural disorganization was obvious in infected tissues. The different developmental stages (meronts and sporonts) and a few mature spore could be observed in direct contact with cell cytoplasm.

Key words: *Bombyx mori,* cytoplasm, microsporidia, Lamerin, spore.

INTRODUCTION

Microsporidia are obligate intracellular parasites of silkworm *Bombyx mori* L, reported to cause infection in various susceptible tissues (Nageswara Rao et al., 2004; Selvakumar et al., 2005). The intensity of microsporidian infection is tissue specific therefore testing of individual tissue gives more accuracy than the whole larval crushing (Bhat, 2006). There are previous reports available on wide spectrum effects of microsporidia on the silk gland and other essential organs of the silkworm, *B. mori* (Joythi et al., 2005). Recently, a microsporidian has been reported from Lamerin breed of the silkworm which transmits infection both horizontally and as well as vertically (Bhat, 2006). However, no information was available on the effect of the said microsporidian on gut and fat bodies of the host and thus the present study was undertaken.

MATERIALS AND METHODS

A portion of tissues (gut and fat bodies) was dissected from 5th instar infected larvae under a dissecting microscope (Leica, wild - M8). The tissues were placed in fresh 3% (v/v) glutaraldehyde, fixed overnight at 4°C and post fixed in 1% osmium tetraoxide for 2 h, washed, dehydrated in an ascending series of alcohol, and passed through propyle oxide and infiltrated with araldite and propyle oxide for 12 h. The samples were centrifuged and sediments were infiltrated again with fresh araldite, embedded in araldite and kept at 60°C for 48 h (Bhat, 2006). Ultra thin sections (700-800^{o}A) were double stained with Uranyl acetate and lead citrate, observed and photographed under 60KVA (JEOL 100CX) electron microscope.

RESULTS AND DISCUSSION

Ultra structure of the infected tissues revealed different developmental stages of the spore (meront or sporonts), mature spores and marked structural disorganization of tissues with large empty spaces (Plate 1). The meronts were irregular in shape with differentiated cytoplasm enclosed by plasma membrane. Meronts developed into the sporonts (sp) that showed the same structure as the meronts except thick osmophillic wall (Plate 1a). The size of meronts and sporonts was 0.46 and 1.11 µm in length and 0.32 and 0.78 µm in width respectively. The shape of the mature spore was ovo- cylindrical with 4.36 µm in length and 2.14 µm in width. Since meronts were

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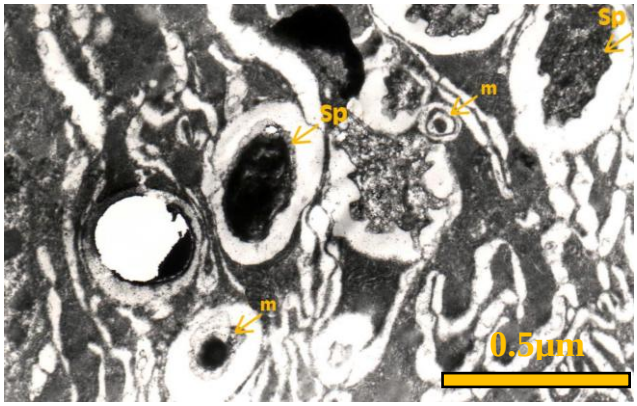
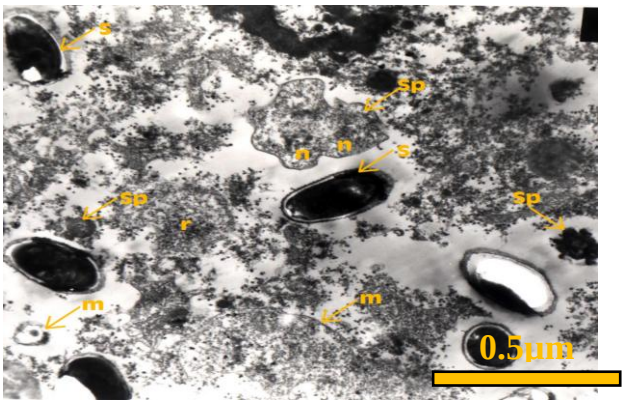


a



b

Plate 1: Cross section of infected tissues a) Gut b) Fat body. m- meront; sp- sporont; s- spore; n-nucleus; r-ribosomes.

extremely rare and presumably transformed into sporonts, the sporonts appeared to be the major proliferative stage.

In the present study the infected larvae did not show any external visible sign of infection and were identified after examination of selected tissues (Gut and fat bodies). During histopathological observations, various developmental stages of microsporidia, mature spores (1-5 mature spores/ microscopic field) could be observed in direct contact with cell cytoplasm. Disorganization of the cell organelle with large empty spaces was observed in infected tissues due to the proliferation of the microsporidia. The present study is in conformity with the observation conducted by Petri (1965) where he reported the destruction of host cytoplasmic structures around the parasite by proteolytic enzymes and formation of large empty spaces in the host infected tissues. Further, the intensity of microsporidia spores were more in fat body as compared to gut which is in conformity with the results of Bansal et al. (1997) where they reported higher concentration of spores in gonads followed by fat body and gut of various sericigenious species v*iz*., *Antheraea mylita*, *Antheraea assama* and *Bombyx mori.*

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