

The schizogenous proliferation and tissue cyst development in sheep of Sarcocystis sp. from dogs; as revealed by light and electron microscopy.

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Sheep raised under specific-pathogen-free conditions were infected with Sarcocystis sporocysts obtained from dogs that had been fed fresh sheep meat infected with microscopic tissue cysts possessing thick, finely-striated cyst walls. The various developmental stages of the parasite were examined in 1 µm semi-thin sections under the light microscope and in 50 nm ultra-thin sections under the electron microscope.

Two distinct schizont generations were detected in the infected sheep; the first occurring in arteriole endothelia 6-19 days post-inoculation (dpi) and the second in capillary endothelia 21-34 dpi. Both schizont stages developed merozoites by outward lobulations of the enlarged schizont nucleus and inward lobulations of the schizont pellicle. Each merozoite developed a conoid, rhoptries, micronemes and subpellicular microtubules during its formation. Division appeared as a specialized multiple fission process where up to 30 daughter cells (merozoites) budded almost simultaneously from the mother cell (schizont).

Developing tissue cysts were then detected in the striated muscles of the sheep 41-134 dpi. Firstly, merozoites that had invaded the muscle fibres had undergone primary division 41-45 dpi forming large ovoid cells (i.e. metrocytes). The metrocytes contained large diffuse nuclei and were pellicle-bound and each cyst was enclosed by a thin primary cyst wall. Repeated endodyogenous division 50-55 dpi resulted in the formation of numerous metrocytes. After 65 dpi, such division produced numerous characteristic merozoites arranged in compartments formed by septae in the cyst ground substance.

The primary cyst wall around each cyst developed protusions firstly at 50 dpi and these appeared as short and blunt with some central electron-dense material. After 65 dpi, all protusions had developed to elongate 'hair-like' in appearance with some apical electron-dense material.

After examination of the literature, the possibility exists that two microscopic species of Sarcocystis occur in sheep; both being infective to dogs. Unfortunately, the taxonomic considerations are extremely confused. The species described in this study was typified by microscopic cysts possessing 'hair-like' wall protusions. This is quite distinct from the microscopic cysts previously described as having 'palisade-like' wall protusions (i.e. those named S. ovicanis Heydorn et al. 1975). Clarity is unfortunately not afforded by the original description of microscopic cysts in sheep (i.e. those named S. tenella Railliet 1886); as both types of cysts fit the light microscopic description. Re-classification studies on our type-species must be undertaken to achieve some degree of clarity.

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