Morphological and molecular analyses of larval taeniid species in small mammals from contrasting habitats in Denmark - DTU Orbit (10/12/2018)

Morphological and molecular analyses of larval taeniid species in small mammals from contrasting habitats in Denmark

Taeniid infections in intermediate hosts manifest themselves as extraintestinal larval stages which, in early development, lack species-specific characteristics. The inability to distinguish infections of zoonotic importance such as Echinococcus multilocularis from other taeniid infections that have mainly veterinary significance stimulated the development of species-specific molecular diagnostics. In this study, the prevalence of taeniid infections in potential intermediate hosts was evaluated using both morphological diagnosis and a newly described multiplex Polymerase Chain Reaction (PCR) for species determination. Small mammals (N=719) were trapped in three different types of habitats in north-east Zealand, Denmark. The sensitivity of the multiplex PCR (90.5%) exceeded that of morphological examination (57.9%) for identifying 95 taeniid infections. The use of the multiplex PCR resulted in higher prevalence rates due to improved detection of immature liver infections with Hydatigera taeniaeformis and Versteria mustelae, but did not affect the observed prevalence rates of peritoneal metacestodes of Taenia polycanthra. The prevalence of taeniid infections showed a significant difference according to habitat type, potentially identifying a ‘sylvatic’ transmission and an ‘urban’ transmission with marked variation among different taeniid species. Versteria mustelae and T. polycanthra were more prevalent in rural forests, while infections with H. taeniaeformis were dominant in urban parks/forests and in residential and farm gardens. The multiplex PCR facilitated a better utilization of wildlife samples by yielding a higher number of definitive diagnoses of ambiguous taeniid infections in liver lesions, allowing for more accurate epidemiological data and, hence, a more accurate risk assessment.

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