Abstract

Echinococcus granulosus parasite exists in two distinct life cycle patterns; domestic cycle involving domestic dogs and livestock; and sylvatic cycle that involves wild canids and wild herbivores. Humans become infected via ingestion of taeniid eggs shed by infected canids. Characterization of echinococcus species, the major cause of Echinococcus is necessary for prevention and control. This study was carried out to characterize genotypes and haplotypes of Echinococcus species and the disease epidemiology in wildlife and domestic cycles in Samburu and Maasai Mara game parks and surrounding environments. Humans in two pastoral communities, were examined for presence of hydatid cysts. Additionally, animal organs were collected for inspection of hydatid cysts. Faecal samples were also collected for taeniid eggs examination, and those specimens used for genotypic and haplotype analysis. A total of 4078 (1501 Samburu and 2577 Maasai Mara) individuals were examined by ultra sound for presence of hydatid cysts. The prevalence for the presence of cystic echinococcosis (CE) was 1.2% within Maasai Mara and 1.1% in Samburu. Prevalence was high in women compared to men with majority of cysts sequestered in the liver followed by the lungs. Nine hundred and six faecal samples (906) of domestic dogs were screened and 6.1% were positive for taeniid eggs. In wildlife, 729 faecal samples of wild carnivores had a 7.3% taeniid eggs positivity. Molecular analysis of cyst samples from Samburu and Maasai Mara livestock yielded 33.2% and 38.8% distinct sequences respectively. Specific genotypes in Samburu Echinococcosis granulosus (G1-3), Echinococcus canadensis (G6/7) and Echinococcus ortleppi (G5). Defined sequences in Maasai Mara livestock were 38.2% and all were Echinococcus granulosus (G1-3). In samburu, genotypes in domestic dogs were 9E. granulosus (G1-3) and 47E. felidis while other Taenia in the area included 7T. multiceps, 10T. madoquae and Taenia species, a species not yet described globally. In Maasai Mara domestic dog samples, genotypes included 86 E. granulosus (G1-3), 3 E. felidis, 2 E. ortleppi, 1 E. canadensis, 2 T. hydatigena and 2 T. multiceps. In wild carnivores, specific genotypes including 31 E. granulosus (G1-3) the sheep strain, 53E. felidis the lion strain, 2 E. canandensis G6/7,9 T. hydatigena, 1 T. Multiceps, amd T. Saginata, and Maasai Mara 1 E. granulosus (G1-3) (the sheep strain, 57 E. felidis, 6 T. multiceps, and 22 T. hydatigena were identified in Samburu and Maasai Mara respectively Phylogenetic analysis showed markable differences within the two cyles, which seem to overlap. The study concluded that Domestic dogs pose significant danger and residents and transmission of cystic Echinococcosis. There

necessity to unveil intermediate host for the rare echinococcus ortleppi, to reveal existence of Echinococcus canandensis in wildlife, and to explore more on intermediate host for Echinococcus felidis, Finally, more studies on genomic differences between Echinococcus granulosus s.s genotype and Echinococcus felidis are required.