

### 53. Epidemiology and characterization of *Echinococcus* in Samburu and Maasai Mara game park and surrounding environments in Kenya

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#### 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. The disease caused by this parasite is debilitating especially in human and it causes major economic losses to the countries affected. This study was carried out to characterize genotypes of *Echinococcus* species and the disease epidemiology in wildlife and domestic cycles. The study was conducted in Samburu and Maasai Mara game parks and areas close to the reserves. Humans in two pastoral communities, living in study areas 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 analysis. A total of 4078 individuals were examined by ultrasound for presence of hydatid cysts. The prevalence of cystic *echinococcosis* (CE) was 1.2 % within Maasai Mara and 1.1% in Samburu. In addition, a total of 1977 organs were collected from slaughter houses and inspected for hydatid cysts, with 246 (12.4%) percent prevalence. Different animals had varied frequencies of cyst burden with majority of the cysts found in liver and lungs. Nine hundred and six faecal samples of domestic dogs were screened and a taenia prevalence of 6.1% recorded. In wild life, 729 faecal samples of wild carnivores were also collected and screened for taeniid eggs with a positivity of 7.3 %. In Livestock, specific genotypes in Samburu were *Echinococcus granulosus* (G1-3) the sheep strain, *Echinococcus canadensis* (G6/7) the Camel strain and *Echinococcus ortleppi* (G5) the cattle strain. Interestingly, In Maasai Mara livestock, all samples screened typed for *Echinococcus granulosus* (G1-3), the most pathogenic genotype reported globally. In Samburu, genotypes in domestic dogs were *E. granulosus* (G1-3) (sheep strain), *E. felidis* (lion strain) with other *Taenia* species including *T. multiceps*, *T. hydatigena*, *T. madoquae*. For a few *Taenia* speciation was not possible. In Maasai Mara domestic dog samples, *E. granulosus* (G1-3), *E. felidis*, *E. ortleppi*, *E. canadensis*, *T. hydatigena* and *T. multiceps* were found. In wild carnivores, specific genotypes including *E. granulosus* (G1-3) the sheep strain, *E. felidis* the lion strain, *E. canadensis* G6/7, *T. hydatigena*, *T. Multiceps*, and *T. Saginata*, and Maasai Mara *E. granulosus* (G1-3) (the sheep strain), *E. felidis*, *T. multiceps*, and *T. hydatigena* were identified. Overall, these results indicate possible interlink between domestic and wildlife *Echinococcus* cycles and active transmission of *Echinococcus* and other *Taenia* species. Finally, more studies on genomic differences between *Echinococcus granulosus* s.s genotype and *Echinococcus felidis* are required.

**Keywords:** *Echinococcus* sp.; *Taenia* sp.; zoonoses; hydatid disease