Hook Worm Project

The escalating prevalence of canine hookworm (*Ancylostoma caninum*) infection in the Southeastern United States poses a significant challenge to animal welfare organizations and presents a localized public health risk. In collaboration with local animal shelters, the Hookworm Project was initiated to develop a high-specificity molecular assay capable of detecting *A. caninum* genetic material directly in environmental samples. Utilizing Polymerase Chain Reaction (PCR) targeting conserved mitochondrial genes, the team has established a reliable screening method for both soil and water matrices. Current efforts are focused on environmental surveillance across Horry County and shelter facilities to accurately map the disease's prevalence and inform evidence-based parasite control strategies.

Canine hookworm, caused primarily by *A. caninum*, is a growing concern, particularly within high-density animal populations such as those maintained by animal shelters. The shared use of outdoor facilities creates an environment conducive to continuous transmission. A major complicating factor is the parasitic organism's resilience; eggs and infective larvae can persist in soil for prolonged periods, remaining infectious even after source animals have been adopted and removed from the premises.

The Hookworm Project was conceived to meet this critical need by developing a direct environmental diagnostic test.   To achieve high sensitivity and specificity for *A. caninum* detection, a genetic screening protocol based on Polymerase Chain Reaction (PCR) was developed. This molecular assay is designed to amplify unique signature sequences within the hookworm genome. The primary targets selected for amplification are segments of two key mitochondrial genes: Cytochrome Oxidase Subunit 1 (Cox1) and Cytochrome b (Cytb)

The project has transitioned into an active surveillance phase to accurately determine the local ecological burden of *A. caninum*. This effort involves two primary sampling arms: Community Water Sampling: Collection of water samples across Horry County to assess general environmental dispersal and potential sources of widespread contamination. Targeted Animal Shelter Soil Sampling: Collection of soil samples from the communal outdoor enclosures of collaborating animal shelters, which are considered high-risk transmission hotspots.

Data gathered from this surveillance will be crucial for establishing baseline prevalence rates and identifying spatial clusters of contamination. This information is intended to be used by shelter management to: (1) Prioritize areas for intensive chemical or heat treatment for parasite remediation, (2) Establish mandatory rotation schedules for shared outdoor runs, (3) Refine internal veterinary protocols for preventative treatment and deworming.