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Molecular Epidemiology of Anthrax in Georgia

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Abstract : Anthrax is a fatal disease caused by strains of Bacillus anthracis, a spore-forming gram-positive bacillus that causes the disease anthrax in animals and humans. Anthrax is a zoonotic disease that is also well-recognized as a potential agent of bioterrorism. Infection in humans is extremely rare in the developed world and is generally due to contact with infected animals or contaminated animal products. Testing of this zoonotic disease began in 1907 in Georgia and is still being tested routinely to provide accurate information and efficient testing results at the State Laboratory of Agriculture of Georgia. Each clinical sample is analyzed by RT-PCR and bacteriology methods; this study used Real-Time PCR assays for the detection of B. anthracis that rely on plasmid-encoded targets with a chromosomal marker to correctly differentiate pathogenic strains from non-anthracis Bacillus species. During the period of 2015-2022, the State Laboratory of Agriculture (SLA) tested 250 clinical and environmental (soil) samples from several different regions in Georgia. In total, 61 out of the 250 samples were positive during this period. Based on the results, Anthrax cases are mostly present in Eastern Georgia, with a high density of the population of livestock, specifically in the regions of Kakheti and Kvemo Kartli. All laboratory activities are being performed in accordance with International Quality standards, adhering to biosafety and biosecurity rules by qualified and experienced personnel handling pathogenic agents. Laboratory testing plays the largest role in diagnosing animals with anthrax, which helps pertinent institutions to quickly confirm a diagnosis of anthrax and evaluate the epidemiological situation that generates important data for further responses.

Keywords : animal disease, baccilus anthracis, edp, laboratory molecular diagnostics
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