

# Neuropathogenicity of an atypical anthrax causing bacterium – *Bacillus cereus* biovar anthracis

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*Bacillus anthracis* is capable of invading the central nervous system in both animals and humans. It can elicit meningitis, a severe complication of systemic anthrax, with a mortality rate nearing 100 %. In the past two decades, it has become evident that anthrax can be caused by bacteria distinct from *B. anthracis*. One such bacterium is *Bacillus cereus* biovar *anthracis* (*Bcbva*), which is responsible for wildlife deaths across sub-Saharan African rainforests. Among its hosts is one of our closest relatives, the chimpanzee, suggesting *Bcbva*'s zoonotic character. In this study, we investigated the previously uncharacterized neuropathogenic potential of *Bcbva*. We examined four formalin-fixed brains from chimpanzees that succumbed to *Bcbva* infections, using MRI and histology techniques, which were collected under strict biosafety measures as part of an ongoing wildlife health monitoring program in the Tai NP. Our findings revealed that, similar to *B. anthracis*, *Bcbva* is capable of breaching the blood-cerebrospinal fluid barrier and invading the meninges. Additionally, all cases exhibited *Bcbva* infiltration within the brain parenchyma, indicating a higher propensity to penetrate the glia limitans compared to *B. anthracis*. Moreover, *Bcbva* was found to extensively degrade brain tissue, as evidenced by significant extracellular matrix degradation. Limited activation of glial cells suggests a rapid demise following infiltration of the central nervous system.

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## Professional Status of the Speaker

PhD Student

## Junior Scientist Status

Yes, I am a Junior Scientist.

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