



Diagnosis of *Burkholderia pseudomallei* in Soil Samples from Goat Farms in the Lower Northeastern Region

Niramol Sriwongsa^{1,*}, Kan Saratho¹ and Aroonpan Prerdprao¹

Veterinary Research and Development Center (Lower Northeastern region)

Corresponding author; E-mail: Niramolsriwongsa@gmail.com

Background: Melioidosis is a severe infectious disease caused by the environmental bacterium *Burkholderia pseudomallei*. Livestock, particularly goats, have been identified as the most susceptible species to *B. pseudomallei* infection, showing the highest morbidity rate and causing significant economic losses due to high mortality and abortion rates. This disease is prevalent in the lower northeastern region of Thailand. Soil serves as a critical reservoir for the pathogen, posing a health risk to both animals and humans.

Materials and Methods: A total of 69 soil samples were collected from 23 sampling points at three depths: surface soil, 15 cm, and 30 cm. The samples were analyzed using culture techniques with Threonine Basalt Salt Solution (TBSS) and Modified Ashdown's agar (ASH). Microbial identification was confirmed by polymerase chain reaction (PCR) using specific primers targeting the genomic region

TTS1-orf2(BpTT4176F:5'-CGTCTCTATACTGTCGAGCAATCG-3', BpTT4290R:5'-GTGCACACCGGTCAGTATC-3'), yielding a 115 bp PCR product. Antimicrobial susceptibility testing was performed using the disk diffusion method against 10 antibiotics: amoxicillin, colistin, gentamicin, cefotaxime, ceftazidime, ciprofloxacin, doxycycline, norfloxacin, ofloxacin, and tetracycline.

Acknowledgements

The authors thank the staff of the Regional Veterinary Research and Development Center, Department of Livestock Development, Thailand, for their technical assistance and support. We also acknowledge the cooperation of Goat Farms in this study.

Results: *B. pseudomallei* was isolated from 27.54% (19/69) of the soil samples. The detection rates were 8.70% (6/69) at the surface level, 10.14% (7/69) at a depth of 15 cm, and 8.70% (6/69) at a depth of 30 cm. Antimicrobial susceptibility testing revealed that 100% (19/19) of the isolates were susceptible to cefotaxime, ceftazidime, ciprofloxacin, doxycycline, norfloxacin, ofloxacin, and tetracycline. Conversely, all isolates exhibited resistance to amoxicillin, gentamicin, and colistin.

Conclusion: The findings demonstrate that *B. pseudomallei* persists at various soil depths within goat farm environments. Soil contamination, especially during high-moisture periods such as the rainy season, indicates an increased risk of melioidosis transmission to both livestock and humans in this region. Antimicrobial susceptibility testing (AST) of the soil isolates demonstrated 100% susceptibility to ceftazidime and doxycycline. Conversely, complete resistance was observed against amoxicillin, gentamicin, and colistin.

References

- Arthur, R., *et al.* Biosafety and biosecurity measures for handling high-risk pathogens: A focus on *Burkholderia pseudomallei* and melioidosis control. *Journal of Biosafety and Health*. 4: 85–98, 2022.
- BacDive. (n.d.). Bacterial Diversity Metadatabase. Retrieved March 21, 2026, from <https://bacdive.dsmz.de/>
- Chowdhury, A., Mazumder, S., Farook, S., Melan, A., Mondal, S. R., Rahman, F., Barai, L., and Jilani, M. S. A. Detection of *Burkholderia pseudomallei* in soil from Gazipur and Chattogram districts, Bangladesh using an optimized enrichment and PCR-based approach. *The Microbe*. 9: 100616, 2025.
- Choy, J. L., Mayo, M., Janmaat, A., and Currie, B. J. Comparison of diagnostic laboratory methods for identification of *Burkholderia pseudomallei* animal melioidosis in Australia. *Acta Tropica*. 74: 153, 2000.