Bacteria isolated from the cockroach *Periplaneta americana* produce compounds with antibacterial activity against priority pathogens

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Antimicrobial resistance (AMR) has become a global public health problem. In 2019, there were 1.14 million deaths directly attributable and 4.71 million deaths associated to infections caused by antibiotic-resistant bacteria[1]. The World Health Organization (WHO) elaborated a global action plan to control AMR, being the development of novel antimicrobial compounds a major objective in this plan. Additionally, the WO published a list of bacteria, denominated priority pathogens, for which there is an urgent need to develop new antibiotics; this list includes antibiotic-resistant *Acinetobacter baumannii*, *Staphylococcus aureus*, and *Pseudomonas aeruginosa*[2]. Most antibiotics have been derived from soil bacteria. Recent studies have revealed the potential of insect symbiont bacteria as a source of novel antimicrobial compounds[3]. In this study, we isolated different bacteria from the cockroach *Periplaneta americana* which inhibit the growth of the priority pathogens *A. baumannii*, *S. aureus* and/or *P. aeruginosa*. The isolates that showed the greatest growth inhibition activity were identified as *Bacillus* spp. Extracts from the supernatant culture obtained with solvents exhibited growth-inhibitory effect against reference and multidrug-resistant strains of *S. aureus* and *P. aeruginosa*. Additionally, toxicity assays revealed that the extract did not cause hemolysis of human erythrocytes and were non-toxic in the *Galleria mellonella* model. Notably, administration of n-butanol extracts alleviates the infection by *S. aureus* in larvae of *G. mellonella*. Thus, our results provide additional evidence supporting the potential of insect symbiont bacteria as a valuable source for the discovery of novel antimicrobial compounds.

References

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3. Van Moll L; et al., (2021). *Crit Rev Microbiol*. 47 (5): 562-579.