

Diversity of non-clinical *Acinetobacter* species in a sub-saharan Africa region: evidence of carbapenem-hydrolysing class D- β -lactamase producers

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Although *Acinetobacter baumannii* has been the main agent for healthcare infections, recent reports suggest that some *Acinetobacter* environmental species should be considered as a potential cause of disease. In Angola, there are no previous data on its environmental reservoirs and resistance features. We aimed to unveil the occurrence and diversity of *Acinetobacter* species and the presence of resistance mechanisms in different non-clinical settings in Angola.

Eighty-three samples from healthy volunteers (n=20), wild/farm animals and respective settings (n=36), and aquatic environments (n=20) were collected in 2013. Identification was performed by MALDI-TOF MS and partial sequencing of *rpoB* gene. Antimicrobial susceptibility was assessed by disc diffusion/E-test methods and carbapenemase activity by Blue-CARBA. Carbapenemase genes (*bla*_{NDM}/*bla*_{IMP}/*bla*_{VIM}/*bla*_{OXA-51}/*bla*_{OXA-23}/*bla*_{OXA-58}/*bla*_{OXA-24}/*bla*_{KPC}) and their genetic context were investigated by PCR/sequencing and its genetic location was determined by I-Ceul/S1-hybridizations. Clonality was studied by Apal-PFGE.

A diversity of *Acinetobacter* species (*A.baumannii*, *A.pittii*, *A.berezinae*, *A.soli*, *A.ursingii*, *A.generi*, *A.genospecies15TU*, *A.johnsonii*, *A.junii*, *A.towneri*) was observed in 29 diverse samples, with the detection of some species on previously unreported settings. Among the 73 *Acinetobacter* isolates, 11 presented carbapenems reduced susceptibility, associated with a carbapenemase in 4 of them. Of these 4, one was identified as *A.johnsonii* (domestic drinking water) and present *bla*_{OXA-58} followed by ISAb3, plasmid-located and a multidrug-resistance phenotype. The other 3 isolates corresponded to clonally unrelated *A.towneri* (river and wastewater) and carried *bla*_{OXA-23} preceded by ISAb1, chromosome-located, and presenting MICs > ECOFF to one carbapenem.

This work unveiled the diversity of *Acinetobacter* species in several niches from a geographic region barely studied, suggesting the potential for multi niche adaptation, with evidence of *A.baumannii* dispersion in extra-hospitalar niches. We also described the first worldwide environmental OXA-58-producing *A.johnsonii* isolate and OXA-23-producing *A.towneri* isolates. These results could suggest that human action might drive the spread of antibiotic resistance genes to geographic areas with low selection pressures or that these regions might be at the origin of these genes. In any case, they could act as important reservoirs in the global epidemiological context.