CHARACTERIZATION OF A MULTIDRUG-RESISTANT ESCHERICHIA COLI ISOLATE FROM MUSCA DOMESTICA COLLECTED AT GARBAGE NEXT TO HOSPITAL, IN RIO DE JANEIRO, BRAZIL.

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RESUMO

Antimicrobial resistance is a matter of great concern to world health authorities. Muscoid dipterans are highly synanthropic, feeding on and reproducing in decomposing organic matter and open garbage. As such it acts as mechanical vectors of pathogens, including resistant bacteria. From the perspective of One Health concept, in the present study flies were trapped at garbage containers located next to a public hospital in Rio de Janeiro, Brazil. The strain LEMEF 26 *Escherichia coli* was recovered from a *Musca domestica* specimen. Bacterial identification was determined by MALDI-TOF/MS. The strain was phenotypically resistant to tetracycline, meropenem, cefepime, ceftazidime, cefoxtin, gentamincin and trimethoprim/sulfamethoxazole at the disk diffusion susceptibility method. Modified Carbapenem Inactivation Method (mCIM test) and EDTA-modified carbapenem inactivation method (eCIM) were positive, clearly presenting metallo-β-lactamase activity. The BD Phoenix Automated Microbiology System (BD Diagnostics) revealed the follow profiles: meropenem MIC > 32µg/mL; imipenem MIC> 8µg/mL; ertapenem MIC> 1µg/mL; cefepime MIC >16 µg/mL; cefoxitin MIC> 16 µg/mL; ceftazidime MIC > 16 µg/mL and ceftriaxone MIC > 4 µg/mL. The Polymerase Chain Reaction (PCR) screening revealed the presence of $bla_{\text{NDM-1}}$ and *aac(6')-Ib* resistance genes and IncA/C plasmid replicon type. Electrophoresis of plasmid extraction by the modified Kadu and Liu method resulted in a single band, which was labeled with $bla_{\text{NDM-1}}$ probe at Southern hybridization. Moreover, *in vitro* conjugation assays with *Escherichia coli* J53 suggested conjugative plasmid $bla_{\text{NDM-1}}$ localization. Further studies are needed to understand the genetic context of this gene, but these data are sufficient to demonstrate the importance of houseflies in the dissemination of antimicrobial resistance genes outside the hospitals.

PALAVRAS-CHAVE: Antimicrobial Resistance, One Health, Plasmids.

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