

TITLE: DETECTION OF RESISTANT BACTERIA ISOLATED FROM FLIES COLLECTED FROM GARBAGE NEXT TO A HOSPITAL IN RIO DE JANEIRO (BRAZIL)

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ABSTRACT:

Insects such as blowflies are found worldwide and are mechanical vectors of various pathogens. Moreover can move freely between garbage and hospitals and may play a significant role in the dissemination of antibiotic resistant bacteria. The main objective of this study was the detection of resistant bacteria to cephalosporins and carbapenems isolated from flies collected in garbages next to a municipal hospital, in Rio de Janeiro. Flies were attracted to traps containing bait and were identified using dichotomous keys. Traps were placed close to trash inside and outside the hospital. After collection, they were macerated in saline, diluted and plated in nutrient agar supplemented with ceftriaxone at 1mg/L. After purification of the isolates, antimicrobial susceptibility test was realized by disk diffusion method to imipenem, meropenem, ceftazidime and cefepime (Sensifar). Afterwards, 110 samples were isolated and among these 28 showed resistance in the AST. Chromosomal and plasmidial DNA were extracted and PCR was performed for the genes *bla*_{CTX-M}, *bla*_{NDM}, *bla*_{KPC}, *bla*_{OXA-48}, *bla*_{OXA-23}, *bla*_{OXA-143}, *bla*_{SPM}, *bla*_{IMP}, *bla*_{GIM}, *bla*_{SIM}, *bla*_{TEM}, *bla*_{VIM} and *bla*_{SHV}. Identification of plasmids was performed by PCR-based replicon typing. Strains identification was made by 16S rRNA gene sequencing, MALDITOF MS and VITEK® 2 ID, both from Biomerieux. A strain identified as *Raoultella* sp. harboring the *bla*_{KPC} gene was positive to Inc B/O, IncK and IncF plasmid incompatibility groups, and was isolated from *Malacophagomia filamenta*. Also a *Klebsiella pneumoniae* strain isolated from *Musca domestica* demonstrated resistance to carbapenem and cephalosporins. After PCR the strain was positive to *bla*_{NDM} gene and IncY and IncF plasmid incompatibility groups. PCR on plasmid as substrate suggested plasmid localization of those genes. Insects are numerous and diverse in many environments, therefore these results suggests their potential role in the ecology of antibiotic resistance.

Keywords: bacterial resistance, antibiotics, flies

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