

TITLE: FIRST REPORT OF ISOLATION AND DETECTION OF PATHOGENECITY RELATED GENES IN *Proteus mirabilis* ISOLATED FROM GROUND BEEF SOLD IN BUTCHER SHOPS IN LONDRINA-PR.

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ABSTRACT:

Taking into account that ground beef may be a dissemination source of health threatening bacteria to consumers, this study aimed to evaluate the prevalence of *Proteus mirabilis* in ground beef, as well as to detect genes related to virulence in humans, in order to estimate the strains' possible zoonotic risk. For this, 360 ground beef samples were acquired from butcher shops in Londrina-PR, weighed in 25 grams and incubated in 225 mL of peptone water (Difco™, USA) for 24 hours at 37°C. Subsequently a 1 mL aliquot of the bacterial culture was incubated in Brain Heart Infusion broth – BHI (Difco™, USA) and supplemented with polymixin (0.5 mg/mL) and incubated under the same conditions. The bacterial culture was plated in Xylose Lysine Deoxycholate agar – XLD (Difco™, USA) and once again incubated. Suspect colonies of *P. mirabilis* were selected to biochemical analysis through EPM, MiLI (PROBAC™, BR), Simmons citrate and phenylalanine (Difco™, USA) for species confirmation. Isolates DNA was extracted through the boiling method, while Polymerase Chain Reaction was used to detect *mrpA*, *pmfA*, *ucaA*, *aftA* (fimbriae), *hpmA*, *hlyA* (hemolysins), *zapA*, *ptA* (proteases) and *ireA* (siderophore receptors) virulence genes. *P. mirabilis* isolation was possible in 100 (27.80%) of evaluated samples. Genes *mrpA* and *pmfA* were detected in 100 (100%) isolates, *zapA* in 99 (99%), *hpmA* in 97 (97%), *ptA* in 95%, *ireA* in 59 (59%), *ucaA* in 49 (49%), *aftA* in 42 (42%) and *hlyA* was not found. From all searched genes, *mrpA*, *pmfA*, *zapA*, *hpmA* and *ptA* were detected in most isolates, which points that *P. mirabilis* isolated from ground beef presents much prevalence of these genes. Ground beef possessing *P. mirabilis* with a high virulence potential is an alarming fact, since this species has been associated with a great diversity of human infections and very often isolated from urinary tract infections (UTIs) patients. Thus, consumption of beef with *P. mirabilis* may enable a colonization of the consumer's normal microbiota by these strains, which can occasionally ascend to the urethra and cause UTI. Therefore, consumer caution to prepare and eat beef is of the utmost importance, in order to avoid contact with *P. mirabilis* and its possible infections.

Keywords: Virulence factors, zoonotic risk, fimbriae, hemolysins.

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