Colistin Resistance of *Pseudomonas aeruginosa* Isolated from Snakes

1. Introduction

Antibiotic resistance poses a growing threat to public health all over the globe.worldwide. Undoubtedly inappropriate, unnecessary prescription is a major issue, and thatcause of antibiotic resistance. Antibiotic resistance in agriculture and husbandry animals deserves more focus. Moreover, because the surging level of antimicrobial agents employed byused in veterinary medicine makeshave made animals today potential reservoirs of resistant bacteria [1].

Comment [Editor1]: Please review the chang here, and ensure that your intended meaning has been preserved.

Categorized asInfection caused by *Pseudomonas aeruginosa*, an opportunistic pathogen, nonetheless, Pseudomonas aeruginosa infection could be lethal in theman immunocompromised population [2]. YetHowever, the pivotalmajor problem lies in the intrinsic *P. aeruginosa* antibiotic resistance of P. aeruginosa that, which counteracts the effects of medical treatments [3]. To current knowledge, *P. aeruginosa* is more likely to be an environmental species and passed onthat is transmitted by animal reservoirs, thesuch as snakes, for instance [3]. In fact, the latest report from The Centers of Disease Control illustrates that incidence of snakebites reacheshas estimated more than 1,000 cases incidences of snakebites annually [4], and implicates underestimated suggesting that the role of snakes in *P. aeruginosa* of snake origin infection is underestimated.

However, little is detailed about the determinationinformation regarding the susceptibility of antibiotics that are widely administered within the human population, such as piperacillin/tazobactam and meropenem, is limited [5]. Since Because disease-free snakes might be carriers as well, captive onessnakes of commercial origin and those from research institutioninstitutions were also enrolledincluded in our study. In brief,this study, we performed sensitivity testing of *P. aeruginosa* from snakes' oral cavities and subsequent molecular typing of resistance genes will be outlined in the following paragraph, with further implication of clinical translation and public health responses.

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2. Materials and Methods

2.1. *Pseudomonas aeruginosa* Strains

The study was implemented based onincluded 58 *P. aeruginosa* isolates from disease-free captivated snakes, wild snakes at Endemic Species Research Institute (ESRI),, and clinical cases at NCH University Veterinary Medicine Teaching Hospital. All samples were collectedobtained through sterilized swabbing of oral cavities of the snakes and stored in the transport media on transported to the way to microbiology laboratory. in transport media. Following the aerobic culture routine, the isolates were plated ontoon cetrimide agar and incubated at 35°C in 5% CO_2 and 95% air for 48 hours. Based on theThe acquired colonies, Pseudomonas*P. aeruginosa* was colonies were further determined byanalyzed on the basis of colony morphology, Gram

~~stain~~staining, oxidase test, and API ID 32 GN strips (bioMérieux, Marcy l'Etoile, France).

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2.2. Antimicrobial Susceptibility Testing

~~The minimum~~Minimum inhibitory concentrations (MICs) were identified by Clinical Laboratory Standards Institute (CLSI) [6]. Targeting~~-~~ *P. aeruginosa*, cation-adjusted Müller~~-~~–Hinton broth was ~~engaged to~~used in subsequent serial twofold dilutions of representative antimicrobial agents.~~-~~ *P. aeruginosa*~~-~~ suspension was then adjusted to ~~the~~a turbidity of 0.5 McFarland standard of~~-~~ *P. aeruginosa*~~-~~ ATCC27853, and 100 µL of the bacteria with an inoculum density ~~at around~~of approximately 10^5 CFU/mL was further transferred onto 96-well plates. After incubation at 37°C for 24 hours, the MICs of the respective antibiotics were ~~then~~ categorized into susceptible, intermediate, and resistant ~~based on the interpretation table within~~ according to CLSI ~~guidance~~guidelines. The following antimicrobials were ~~employed~~used in the study: penicillins (piperacillin/tazobactam), cephems (cefotaxime), aminoglycosides (gentamicin and amikacin), lipopeptides (colistin), monobactams (aztreonam), and carbapenems (meropenem).