

AmpC beta-lactamase enzymes are ubiquitous in catfish (*Clarias gariepinus*) cultured in the Nigerian catfish grow-out pond systems

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Abstract. This research was performed to ascertain the ubiquity of bacterial pathogens which hyper-produced AmpC β -lactamase enzymes in adult catfish cultured in the Nigerian catfish grow-out pond systems. Phenotypic and molecular methods were used to isolate and identify bacterial pathogens that hyper-produced AmpC β -lactamase enzymes. The AmpC β -lactamase enzymes produced by the bacterial pathogens were subsequently characterized by BLASTX and RPS-BLAST bioinformatics software as well as with the Cn3D molecular modelling software. Findings from the present study indicated that pathogenic bacterial strains which hyper-produced the AmpC β -lactamase enzymes were isolated from 49 catfish samples out of the 54 catfish samples which were examined. The pathogenic bacterial strains were mainly identified as *Citrobacter freundii* MGH 150, *Enterobacter cloacae* NG 14, and *Enterobacter cloacae* subspecies *dissolvens* HKE 15. The AmpC β -lactamase enzymes produced by the bacterial pathogens were also respectively identified as cephalosporinase hydrolyzing class C CMY-LAT-MOX-ACT-MIR-FOX, CMY2/MIR/ACT/EC family class C beta-lactamase, and CMY2/MIR/ACT/EC family class C beta-lactamase. The presence of AmpC enzymes that are hyper-produced by bacterial pathogens which were isolated from almost all the catfish examined calls for urgent monitoring/surveillance of the Nigerian catfish ponds by the relevant regulatory agencies.

Keywords: cephalosporinase hydrolyzing class C CMY-LAT-MOX-ACT-MIR-FOX; CMY2/MIR/ACT/EC family class C beta-lactamase; *Citrobacter freundii*; *Enterobacter cloacae*.

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