



# Detection of Carbapenem-resistant *Enterobacteriaceae* in Meat, Fish and Vegetable Samples from Selected Wet Markets in Yangon



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## Background and Aim

- Carbapenem-resistant *Enterobacteriaceae* (CRE), newly emerging antimicrobial resistant bacteria, is prevailing worldwide and poses as one of the most pressing public health threats relating to antibiotic resistance.
- In most countries, the number of carbapenemase - producing bacteria from human clinical specimens is rising, and the epidemiological status of these multidrug - resistant bacteria is progressively worsening.
- Furthermore, there were a growing number of reports of carbapenemases found either in bacteria isolated from non-human sources.
- The present study aimed to reveal the occurrence of Carbapenem-resistant *Enterobacteriaceae* in meat, fish and vegetable samples from wet markets in Yangon.

## Methodology

### Study Design

Cross-sectional descriptive study

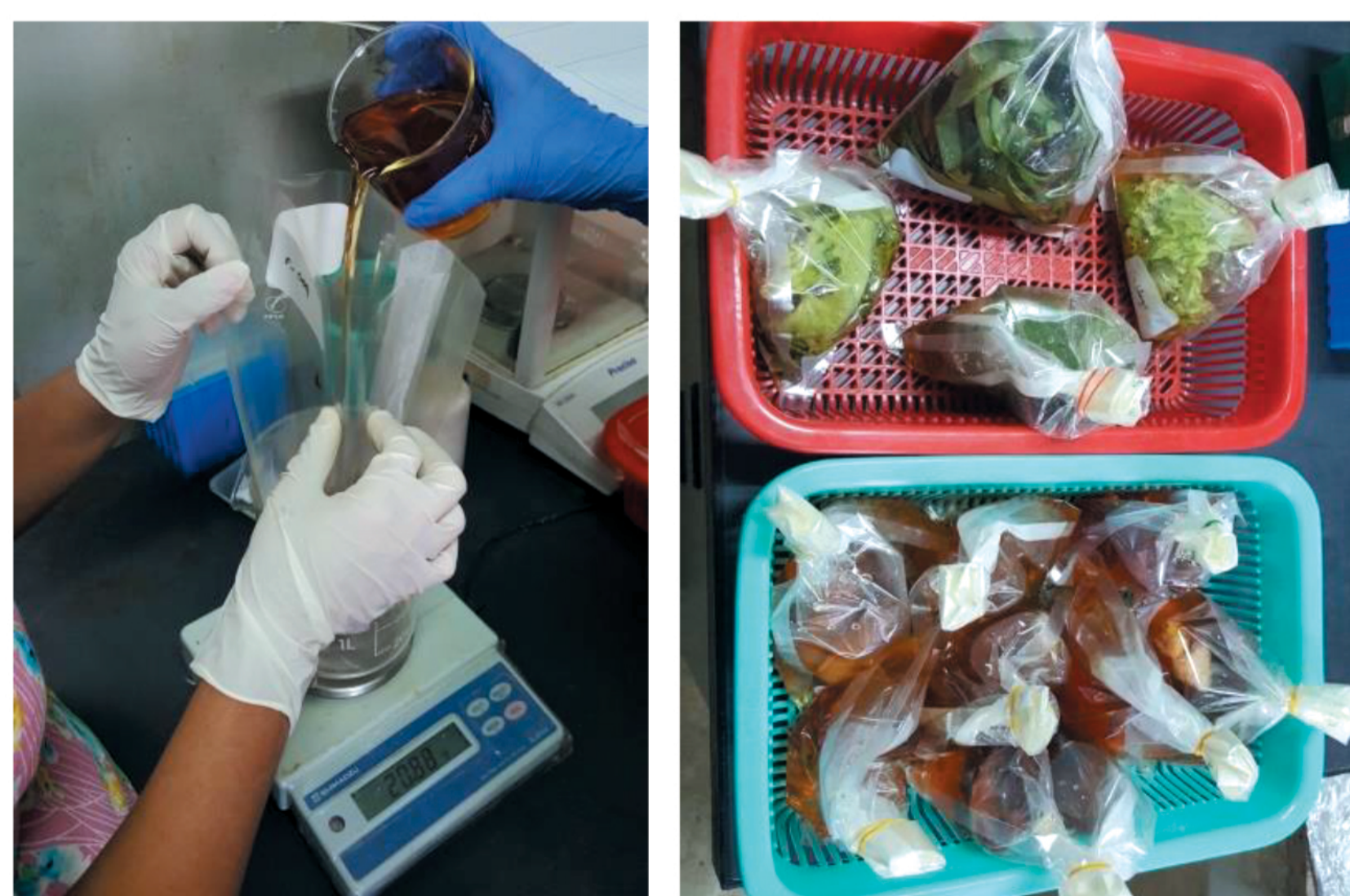
### Study Subjects

Meat, fish and vegetable samples including - chicken, pork, beef, mutton, fish, shellfish, prawn, seafood and vegetables (Total 93 samples)

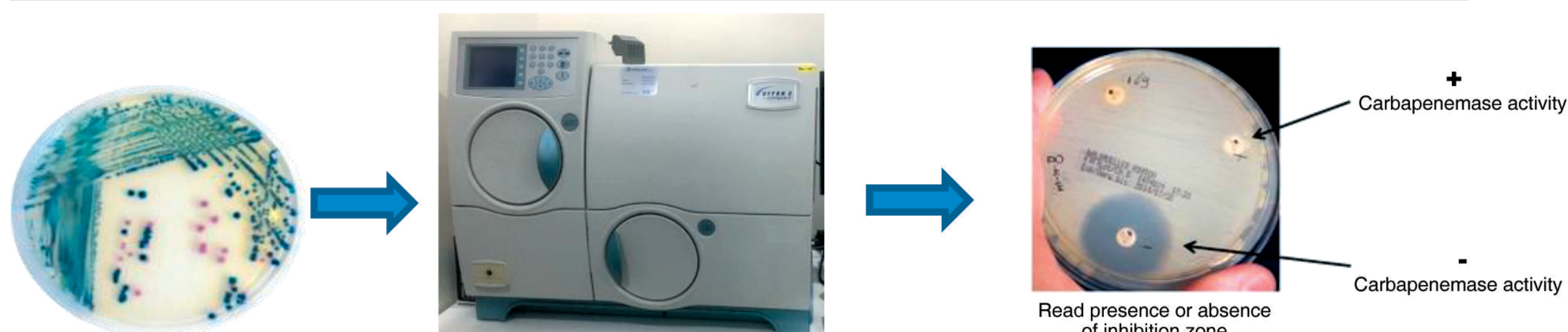
### Study Areas

Samples were collected from randomly chosen 8 wet markets of Yangon Municipal area from four districts.

## Sample preparation



## Bacterial identification, Antibiotic susceptibility testing and Carbapenem inactivation method



## Findings

Among the collected samples, 23 isolates of CRE were obtained from 17 samples (18.3%) as five samples yielded more than one isolate.

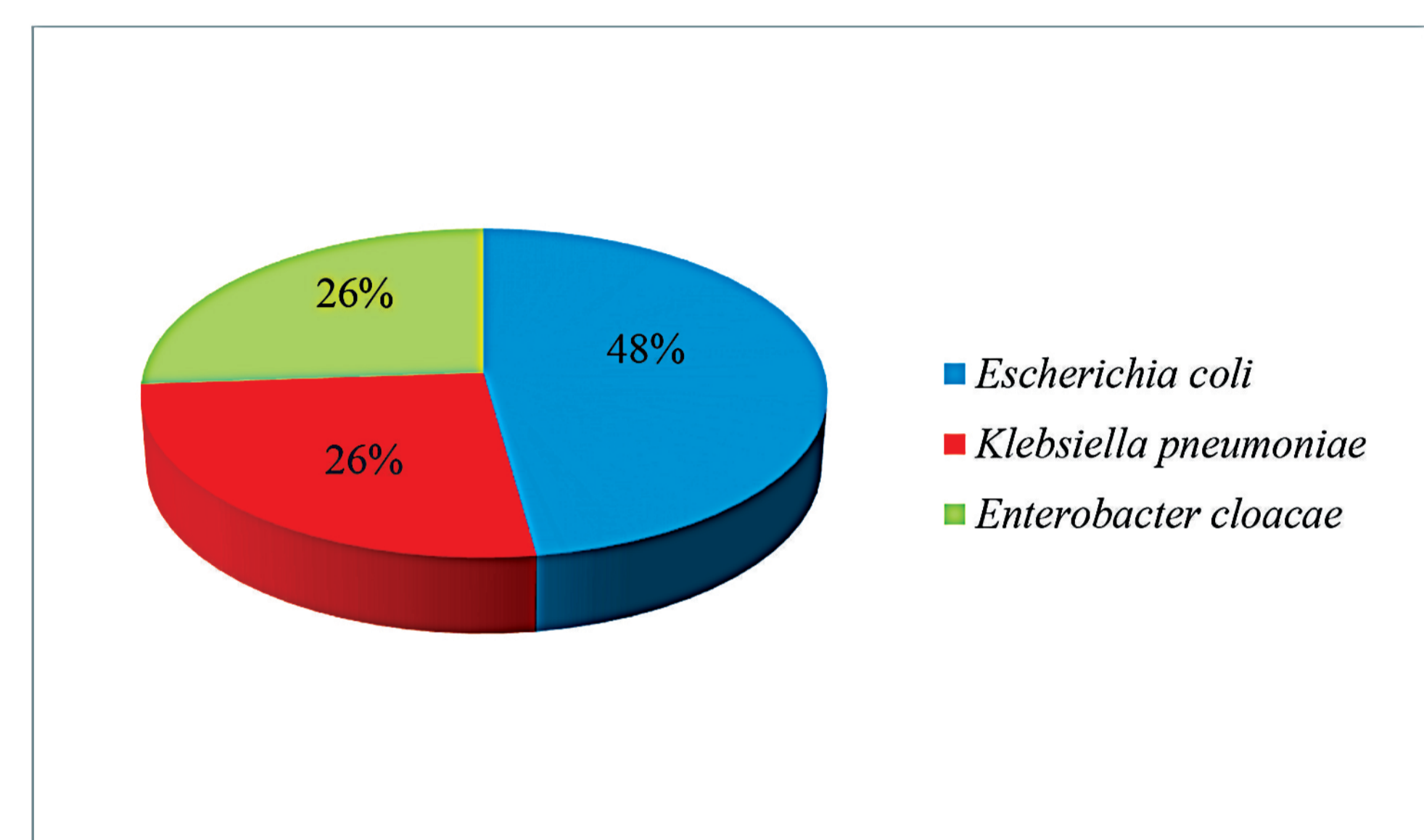


Fig.1. Distribution of Carbapenem-resistant *Enterobacteriaceae* from different types of specimen

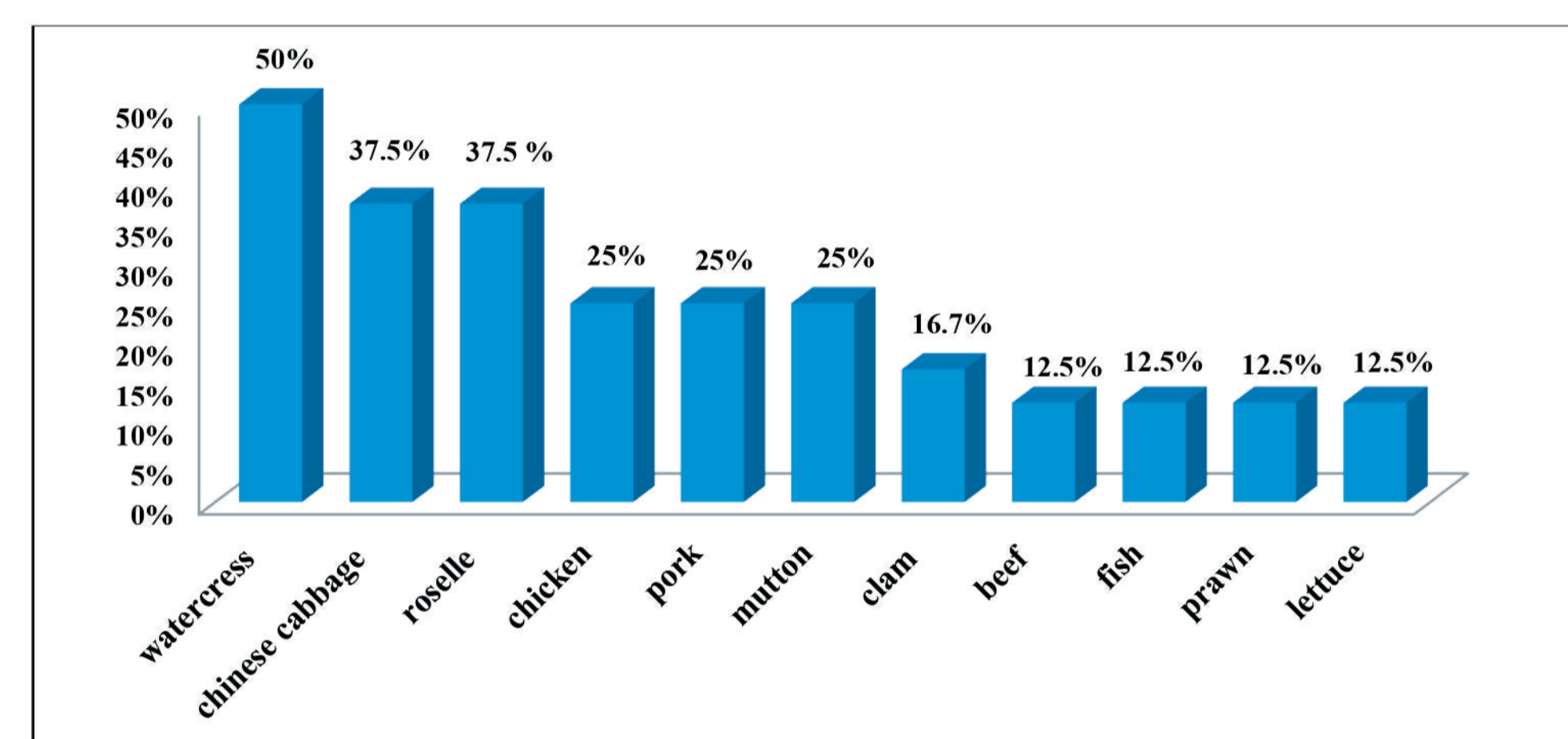


Fig.2. Carbapenem resistant *Enterobacteriaceae* positivity rate from different types of specimen

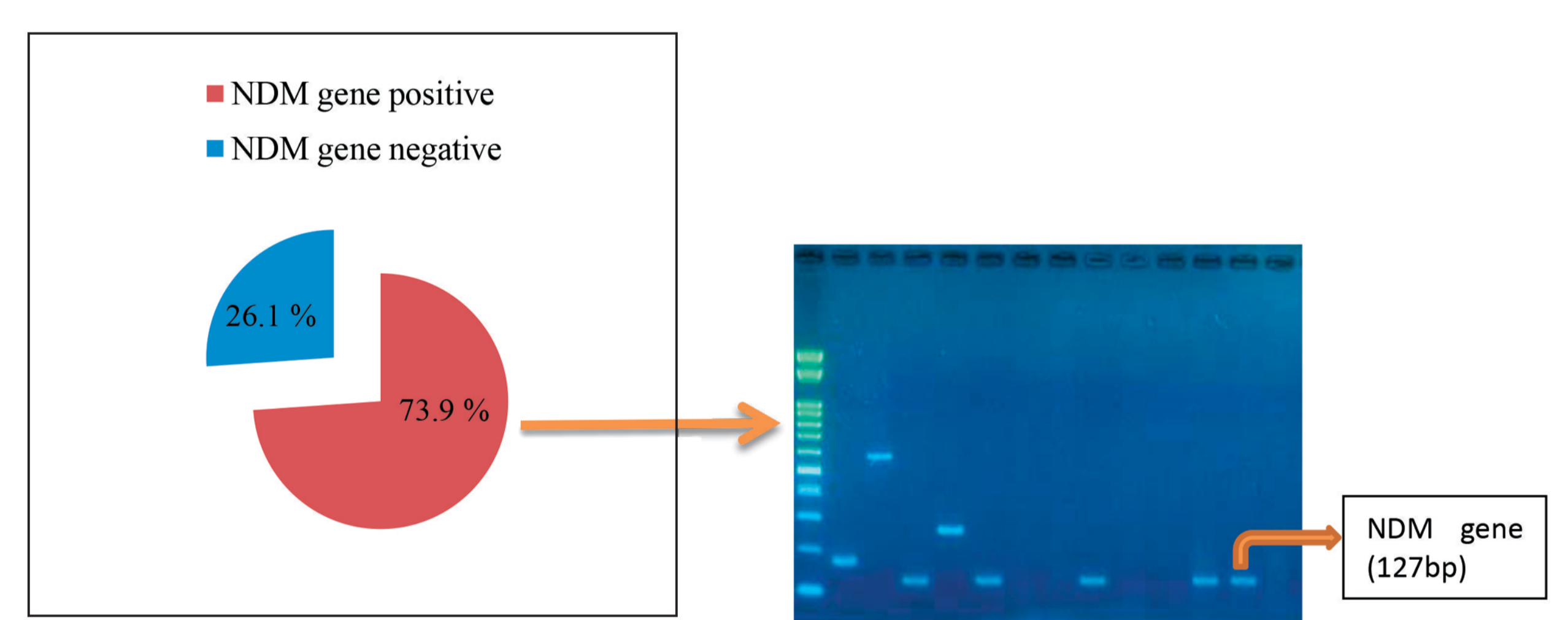


Fig.3. Distribution of NDM genes from isolated CRE

Fig.4. NDM gene after agarose gel electrophoresis

## Discussion and Conclusion

- The higher positivity rate of CRE was detected in vegetable samples and the contamination of bacteria may occur through irrigation water or animal fertilizer and could be related to human contamination during manipulation and conservation of vegetables.
- The presence of CRE and New Delhi metallo- $\beta$ -lactamase (NDM) gene in lettuce, watercress and seafood samples are quite alarming as vegetables such as lettuce and watercress are often consumed raw and changing cultural preferences for eating raw seafood; might be possible sources from which humans could acquire clinically relevant resistant genes, thus posing a serious public health's threat.
- Findings of this study would provide essential insight into the establishment of comprehensive surveillance systems for antibiotic resistance, antibiotic residues and antibiotic use in animal husbandry, aquaculture and agriculture.