

Quantification and characterization of ESBL/AmpC-producing *Enterobacteriaceae* in retail seafood in Germany

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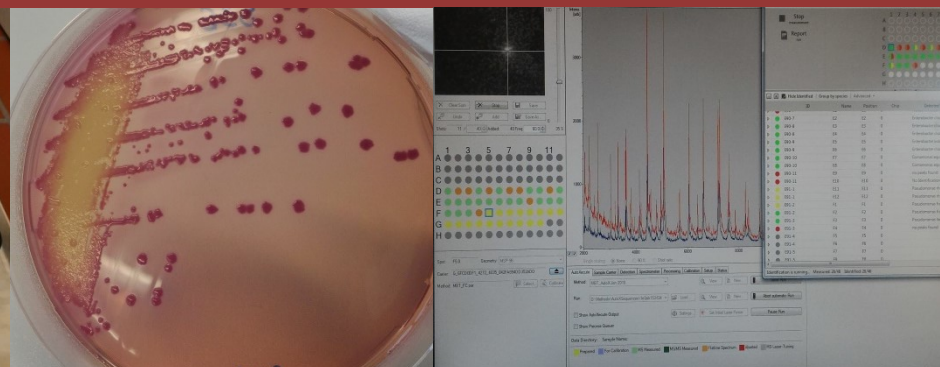
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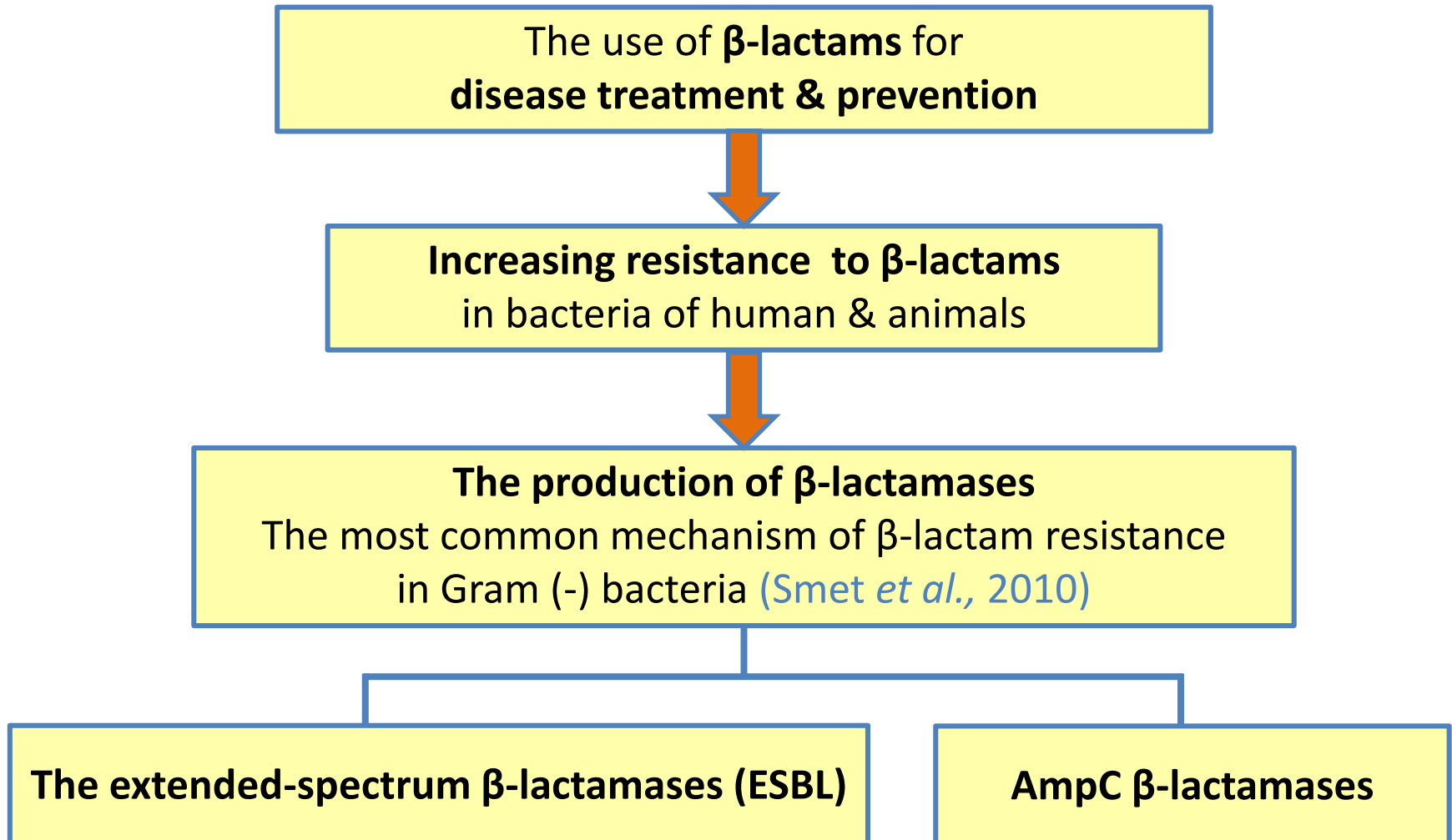
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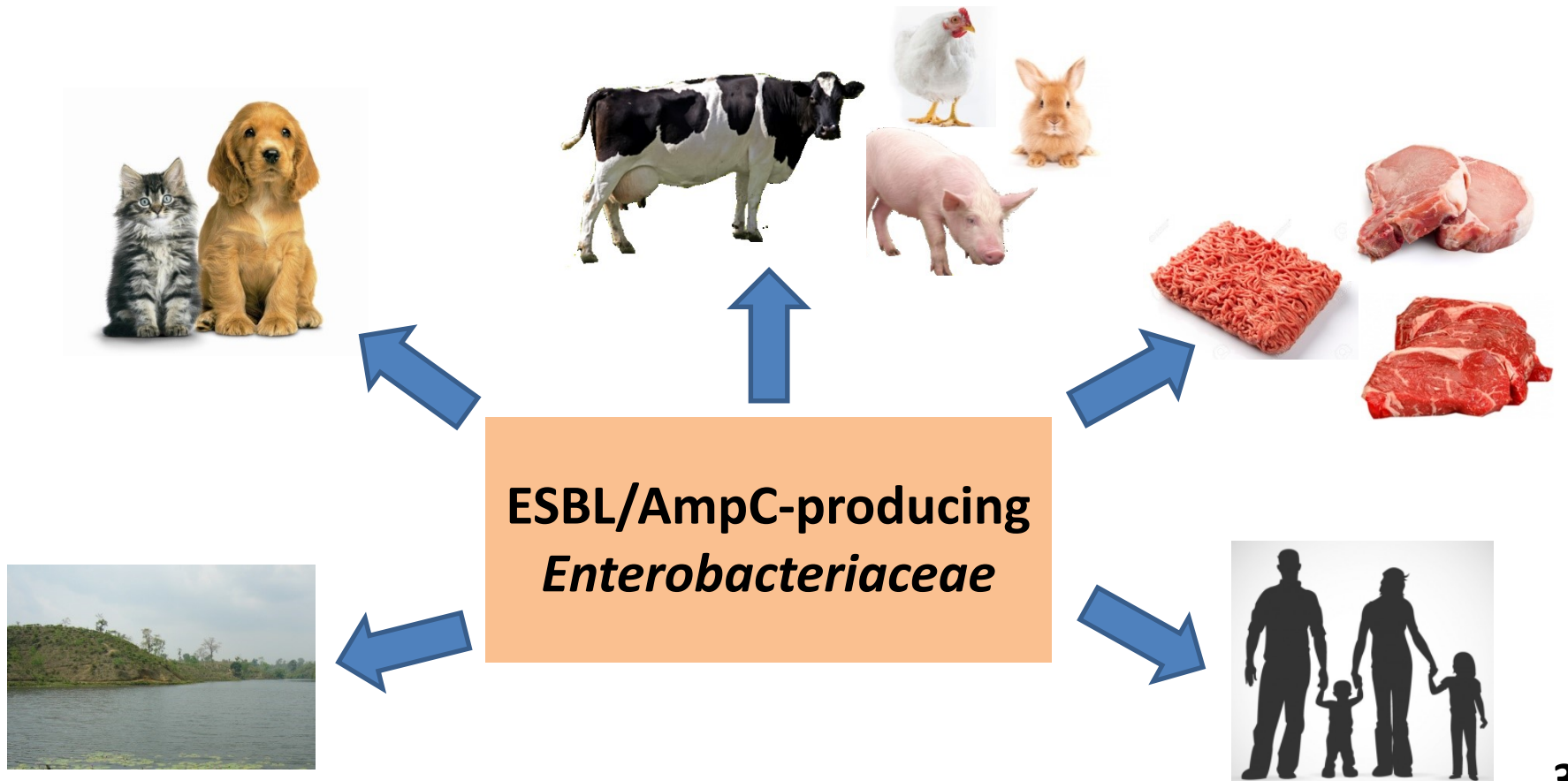


Background



Background

ESBL/AmpC-producing *Enterobacteriaceae*
an emerging public health concern (failures in treatment for infections)



Objectives



- ❑ To determine the prevalence, to investigate the quantitative load, and to characterize ESBL/AmpC-producing *Enterobacteriaceae* in retail seafood in Germany

Materials and Methods

□ Sample collection

- 160 samples (80 shrimp and 80 bivalves)
- Supermarkets and seafood shops in Berlin, Germany
- December 2015 to August 2016

White leg shrimp
(n = 25)



Black tiger shrimp
(n = 55)



Mussels
(n = 49)



Venus clams
(n = 15)



Razor shells
(n = 11)

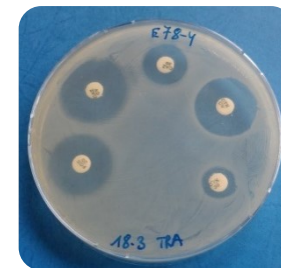
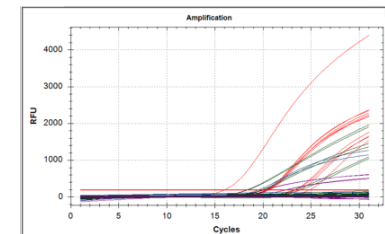
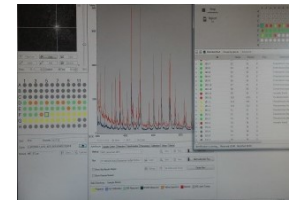
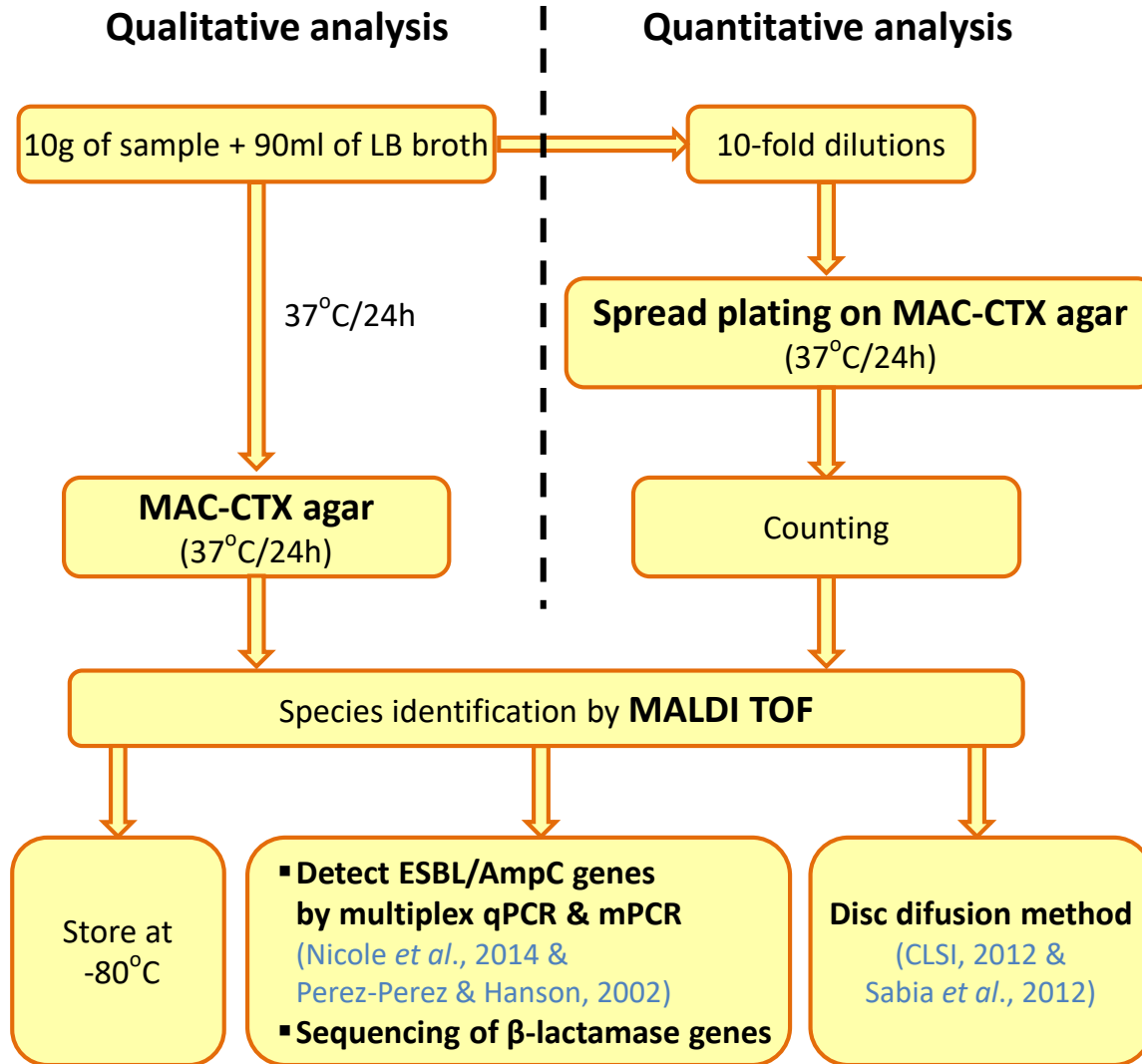


Cockles
(n = 5)

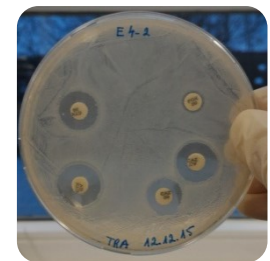


- **Origin countries:** Bangladesh (14), Denmark (14), Ecuador (12), France (7), Germany (8), India (10), Ireland (12), Italy (17), The Netherlands (12), Spain (1), Vietnam (4), unknown (49)

Procedure for isolation and identification of ESBL/AmpC-producing *Enterobacteriaceae*



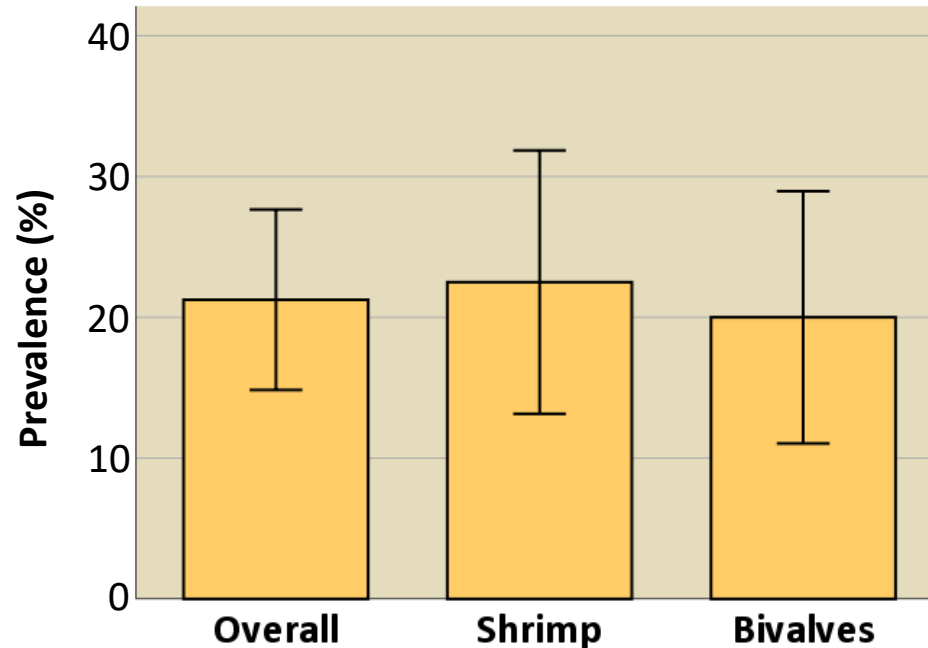
ESBL positive



AmpC positive

Results


Prevalence of ESBL/AmpC-producing *Enterobacteriaceae* in seafood



Prevalence	21.3%	22.5%	20%
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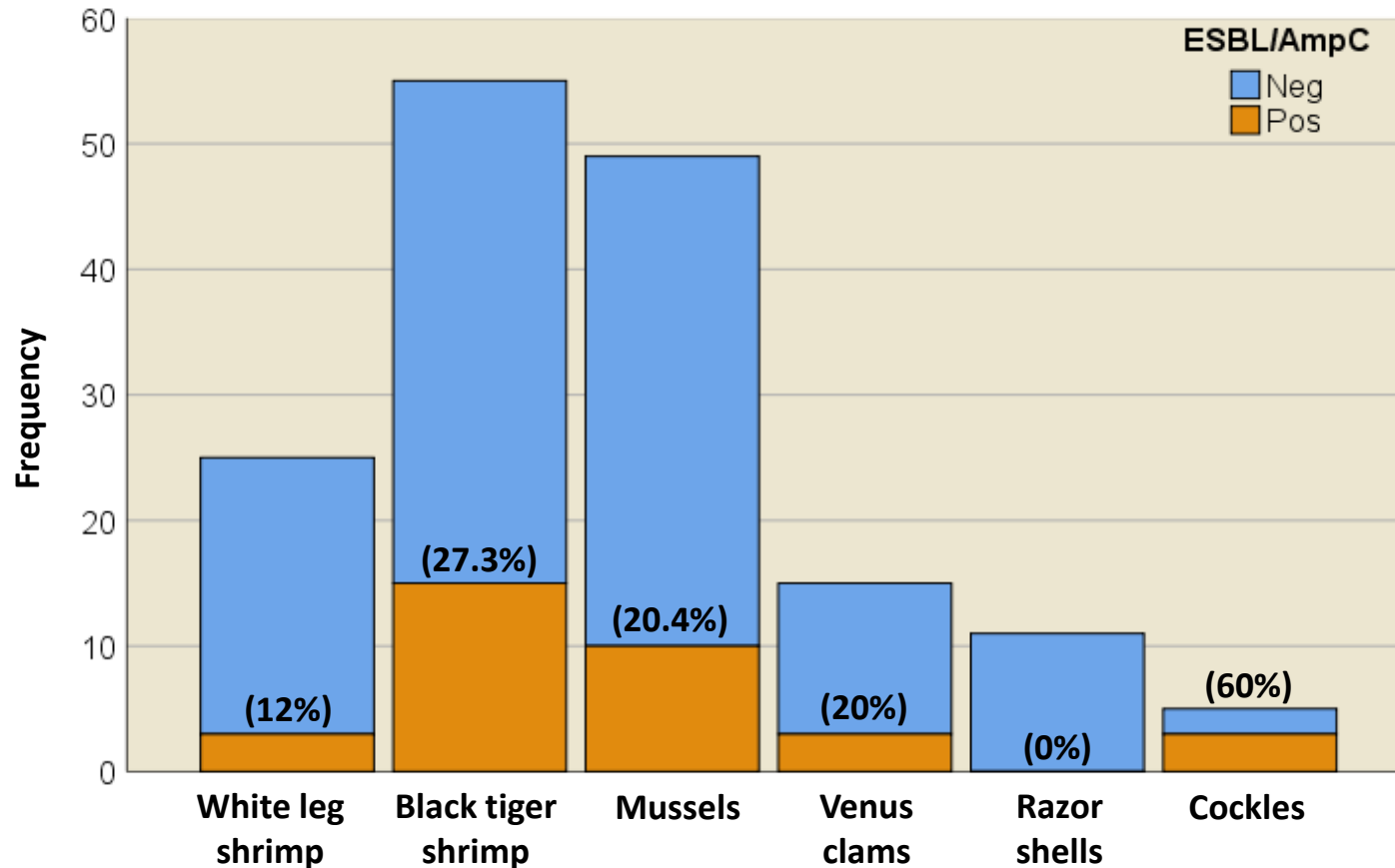
* No significant difference between prevalence of ESBL/AmpC-producing *Enterobacteriaceae* in shrimp and bivalves ($p > 0.05$)

Origin of samples



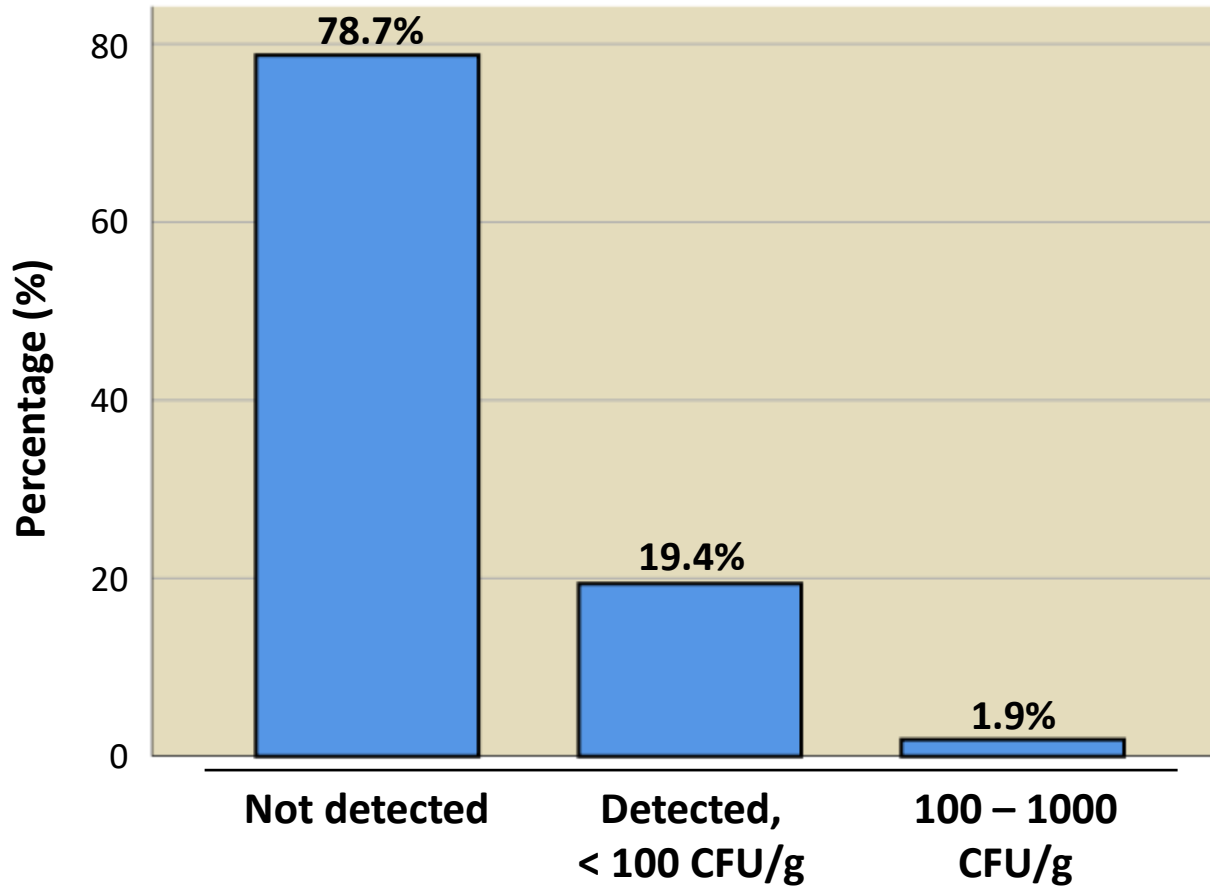
Country of origin	No. of samples	No. of positive samples
Bangladesh	14	1
Denmark	14	4
Ecuador	12	2
France	7	3
Germany	8	0
India	10	4
Ireland	12	2
Italy	17	3
The Netherlands	12	0
Spain	1	0
Vietnam	4	2
Unknown	49	13
Total	160	34

Prevalence of ESBL/AmpC-producing *Enterobacteriaceae* in different seafood species



* No significant difference between prevalence of ESBL/AmpC-producing *Enterobacteriaceae* in different seafood species ($p > 0.05$)

Counts of ESBL/AmpC-producing *Enterobacteriaceae* in seafood (n = 160)



Summary of ESBL/AmpC-producing *Enterobacteriaceae* isolates (n = 45)

ESBL/AmpC-producing *Enterobacteriaceae* isolates:

Citrobacter braakii (1)

Citrobacter freundii (5)

Enterobacter aerogenes (1)

Enterobacter asburiae (1)

Enterobacter cloacae (6)

***Escherichia coli* (12)**

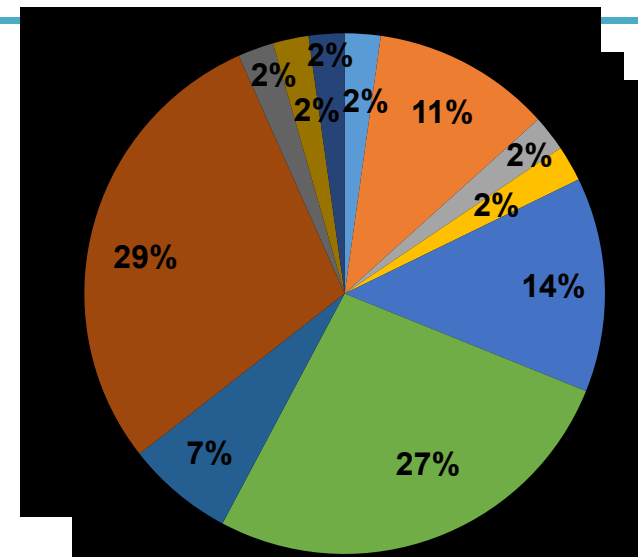
Hafnia alvei (3)

***Klebsiella pneumoniae* (13)**

Leclercia adecarboxylata (1)

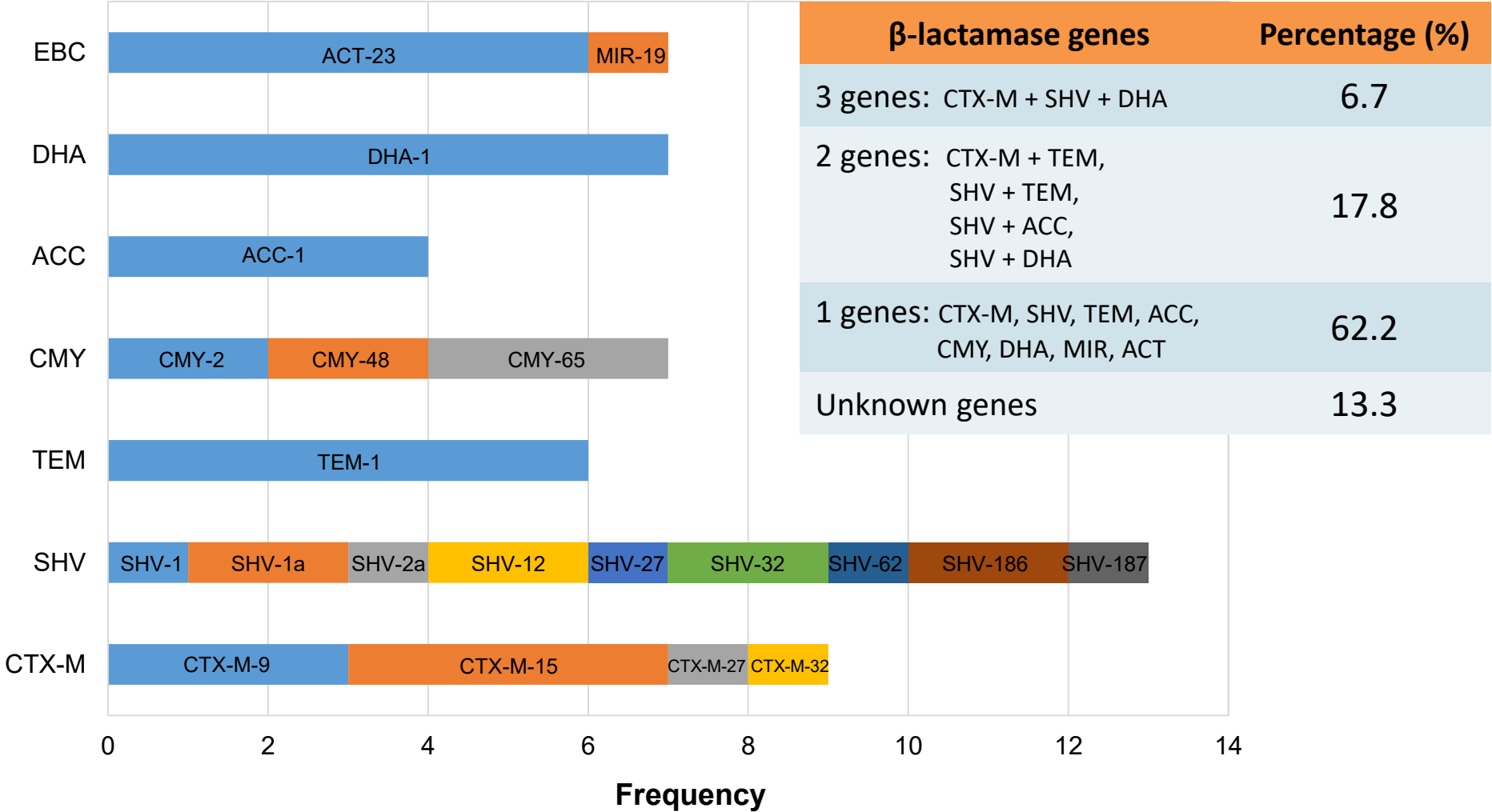
Morganella morganii (1)

Pantoea septica (1)



- Citrobacter braakii*
- Citrobacter freundii*
- Enterobacter aerogenes*
- Enterobacter asburiae*
- Enterobacter cloacae*
- Escherichia coli*
- Hafnia alvei*
- Klebsiella pneumoniae*
- Leclercia adecarboxylata*
- Morganella morganii*
- Pantoea septica*

Characterization of β -lactamase genes in *Enterobacteriaceae* isolates



Conclusion



- ❑ The first report of ESBL/AmpC-producing *Enterobacteriaceae* in retail seafood
- ❑ Evidence of hazard potential of seafood containing ESBL/AmpC-producing *Enterobacteriaceae*
 - Low count but high prevalence

Acknowledgment



DAAD

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MINISTRY OF EDUCATION AND TRAINING

Thank you for your attention!

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